This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

ELEMENTS

OF

PHYSICAL AND POLITICAL

GEOGRAPHY.

DESIGNED AS A

TEXT BOOK FOR SCHOOLS AND ACADEMIES,

AND INTENDED TO CONVEY JUST IDEAS OF

THE FORM AND STRUCTURE OF THE EARTH,

THE PRINCIPAL PHENOMENA AFFECTING ITS OUTER CRUST, THE DISTRIBUTION
OF PLANTS, ANIMALS, AND MAN UPON ITS SURFACE;

TOGETHER WITH ITS

PRESENT POLITICAL DIVISIONS.

BY

CORNELIUS S. CARTÉE, A.M.,

PRINCIPAL OF HARVARD SCHOOL, CHARLESTOWN, MASS.

ILLUSTRATED BY WOOD ENGRAVINGS.

BOSTON:
HICKLING, SWAN, AND BROWN.
1855.

Entered, according to Act of Congress, in the Year 1855, by

CORNELIUS S. CARTÉE,

In the Clerk's Office of the District Court of the District of Massachusetts.

STEREOTYPED AT THE
BOSTON STEREOTYPE FOUNDRY.

PREFACE.

THE department of Natural or Physical Geography has hitherto received but little attention in our schools. The time of the learner has been chiefly spent upon the accidental or artificial divisions of the earth; in learning estimates of population and extent, which, if true to-day, may be false to-morrow; in committing to memory a dry catalogue of names and definitions without any intelligible ideas associated with them — a collection of unmeaning facts, to be forgotten more easily than learned.

It is of comparatively little use for a child to be told that "the earth is one of the planets," if he does not know what a planet is; or to learn the location and extent of certain mountains, seas, and rivers, if he does not perceive their influence upon climate, vegetation, and the condition of man. The study of geography should not be limited to a mere description of the earth's surface, and of the organized existences which inhabit it. We should trace the general phenomena of the globe to the causes from which they originate; we should endeavor to perceive that nice adaptation of means to ends in the relative position, proportion, and configuration of the land and water of the globe, which is so obvious in any single specimen of organic life.

"In teaching geography," says Dr. Wayland, "I would treat it as I would any other branch of physical knowledge. I would look upon the earth as a grand specimen in physical science, presented for our examination. The knowledge of artificial divisions, of national boundaries, number of inhabitants, revenues, exports and imports, will readily associate itself with the knowledge of *natural* divisions, and will be remembered more easily by means of a *vivid objective representation.* It is because the study of geography consists so much of these dry details that it in general awakens no greater interest in the pupil. Pursued as a branch of physical science, we should, in the first place, lay the foundation for wide and valuable generalizations; we should create in the mind a consciousness of the need of geology, history, ethnography, and political economy, and thus accomplish the best purpose of teaching, by rendering every addition to our knowledge an incitement to further acquisition."

In commencing this study, a difficulty is immediately presented to the young learner, in the enormous magnitude of the objects he is to contemplate. His mind is unable to grasp such immensities of extent and diversities of form. With no experience as a traveller or voyager, and, in most cases, having never been far beyond the limits of his native town, he can form no appreciable ideas of the subject. He has learned nothing of geography by observation, he has seen comparatively nothing of the world in which he lives; and what can he be presumed to know? Certainly but little, very little. It is evident, therefore, that the learner must commence the study of geography by first learning the topography of the place where he lives; in other words, he must begin at home. His attention should be first directed to the school room itself—its form, the relative position of the various objects within it. Then let a drawing or map of it be made on the blackboard. Next, by a walk about the grounds of the school house, draw his attention to the prominent objects in its vicinity; determine the position of the edifice by the points of the compass, by which to note the topography of those objects; notice whether the house stands on high or low ground; observe the neighboring trees, rocks, and hills; if there be a brook or river near by, observe its course, and what determines that course. Trace effects to their causes wherever practicable.

After such explorations, let the learner take his slate, and map out such parts of what he has seen as may be thought necessary. Endeavor to give him right ideas of distance, of height and depth. Before alluding to the earth's rotundity, carefully prepare his mind to assent to this fact, by observing the effect produced on his field of view in looking at the surrounding scenery from different heights. If possible, let him get a view from the sea shore, to remark the vessels as they appear in the horizon.

Avoid the use of the technicalities of the science and set definitions, until the learner has attained to such a knowledge of facts and principles, by personal observation, as will serve him for a stand-point from which his imagination may venture to look out without fear of confusion.

If apparatus be essential in teaching natural philosophy and chemistry, it is certainly no less so in the science of geography. Therefore let the school room be amply furnished with artificial globes, models, maps, and pictures of natural scenery. *Relief maps* and *relief globes*, such as are so beautifully and accurately manufactured in Germany, and Professor Guyot's Series of elegantly colored Mural Maps, published in Boston, furnish the best means, of an artificial nature, for imparting right ideas of the earth's surface. These, with any one of the best School Atlases extant, will sufficiently illustrate the following pages.

In the orthography and pronunciation of geographical names, we have followed the "Universal Pronouncing Gazetteer" of Baldwin, whenever available, and have used Dr J. E. Worcester's system of notation. In the compilation of the work, materials have been drawn from various sources; but the author is chiefly indebted to the more recent works of Humboldt, Petermann, Milner, Johnston, Guyot, Miss R. M. Zornlin, and Mrs. Somerville. The author would also gratefully acknowledge his special obligations to M. F. Maury, LL. D., Lieut. U. S. N., Superintendent of the National Observatory at Washington, for much valuable information on the subjects of winds, rains, and currents, and for the privilege of taking copies of several plates from the last edition of "Maury's Sailing Directions."

As a guide to the teacher in conducting recitations, an analysis of the text of each page is given in the foot margin, either as topics or questions. Besides the numerous questions interspersed throughout the work as map exercises and reviews, various problems are appended to certain chapters, the solution of which will require an understanding of the principles previously developed.

Boston, August, 1855.

CONTENTS.

PAGE
Inductive Lessons, ... 11

PART FIRST.

ELEMENTS OF PHYSICAL GEOGRAPHY.

CHAPTER I. — Preliminary Observations, ... 15
II. — The Contours of Land and Water, ... 19
III. — The Reliefs of the Land Surface, ... 23
An Outline of Geology, ... 28
CHAPTER IV. — The Water Surface of the Earth, ... 32
Questions for Map Exercises on the Oceans, ... 36
CHAPTER V. — Mathematical and Astronomical Elements, .. 38
§ 1. Problems, ... 45
2. Exercises on the Maps, ... 47
CHAPTER VI. — Special Geography of North America, ... 50
§ 1. Extent and General Features, ... 52
2. Mountain Systems, ... 53
3. Plateaus, ... 57
4. Declivities and Plains, ... 58
5. River Systems, ... 60
6. Lakes, ... 62
7. Physical Aspects of Central America and the West Indies, 63
8. Geology of North America, ... 65
9. Questions for Review, ... 67
CHAPTER VII. — Special Geography of South America, ... 69
§ 1. Extent and General Features, ... 71
2. Mountain Systems, ... 71
3. Plateaus, ... 74
4. Declivities and Plains, ... 75
5. River Systems, ... 76
6. Lakes, ... 78
7. Geology, ... 79
8. Questions for Review, ... 80
CHAPTER VIII. — Special Geography of Europe, ... 82
§ 1. Extent and General Features, ... 83
2. Central Highlands, ... 84
3. Southern Peninsulas, ... 87

4. Northern Highlands, ... 88
5. The Great European Plain, ... 90
6. River Systems, ... 90
7. Lakes, ... 94
8. Geology, ... 94
9. Questions for Review, ... 96
CHAPTER IX. — SPECIAL GEOGRAPHY OF ASIA, ... 98
§ 1. Extent and General Features, ... 99
2. Mountain Systems, ... 100
3. Plateaus, ... 102
4. Declivities and Plains, ... 104
5. River Systems, ... 106
6. Lakes, ... 109
7. Geology, ... 111
8. Questions for Review, ... 112
CHAPTER X. — SPECIAL GEOGRAPHY OF AFRICA, ... 114
§ 1. Extent and General Features, ... 115
2. Mountain Systems, ... 116
3. Plateaus, ... 117
4. Declivities and Plains, ... 118
5. River Systems, ... 119
6. Lakes, ... 122
7. Geology, ... 122
8. Questions for Review, ... 123
CHAPTER XI. — SPECIAL GEOGRAPHY OF AUSTRALIA, &c., ... 125
CHAPTER XII. — GENERAL AND COMPARATIVE VIEW OF THE CONTINENTS, ... 130
CHAPTER XIII. — GENERAL AND COMPARATIVE VIEW OF THE OCEANS, ... 137
Exercises for Examination, ... 140
CHAPTER XIV. — OF AIR AND WATER AS ENVELOPES OF THE LAND, ... 142
CHAPTER XV. — OF HEAT, ELECTRICITY, AND MAGNETISM, ... 145
§ 1. Heat. Problems, ... 145
2. Electricity, ... 148
3. Magnetism, ... 149
CHAPTER XVI. — OF CLIMATE, ... 151
CHAPTER XVII. — OF WINDS, ... 157
§ 1. General System of Atmospheric Circulation, ... 157
2. Trade Winds and Monsoons, ... 162
3. Winds of the Temperate and Polar Regions, ... 164
CHAPTER XVIII. — OF RAIN, ... 166
§ 1. General Observations, ... 166
2. Of Clouds, ... 168
3. Periodical and Continuous Rains, ... 171
4. Rains of the Western Hemisphere, ... 174
5. Rains of the Eastern Hemisphere, ... 176
6. Summary, ... 178
CHAPTER XIX. — ON OCEAN CURRENTS, ... 179
§ 1. General Observations, ... 179
2. South Polar Current, ... 181
3. Grand Equatorial Current, ... 182
4. The Gulf Stream, ... 183
5. North Polar Currents, &c., ... 185
6. Effects of Currents on Navigation, ... 186

7. Problems, ... 188
8. Exercises for Examination, ... 190
CHAPTER XX. — Geographical Distribution of Vegetables, . 194
CHAPTER XXI. — Geographical Distribution of Animals, ... 202
§ 1. General Observations, ... 202
2. Arctic Fauna, ... 204
3. Temperate Faunas, ... 204
4. Tropical Faunas, ... 205
CHAPTER XXII. — Geographical Distribution of Mankind, . 207
Exercises for Examination, ... 213

PART SECOND.

POLITICAL GEOGRAPHY.

CHAPTER I. — Preliminary Observations, ... 217
§ 1. Political Geography defined, ... 217
2. States of Society, ... 217
3. Of Government, ... 218
4. Of Religion, ... 219
CHAPTER II. — Political Divisions of North America, ... 221
§ 1. People and Countries, ... 221
2. Danish Possessions, ... 222
3. French Possessions, ... 223
4. Russian Possessions, ... 223
5. British America, ... 224
Suggestions to the Teacher, ... 227
CHAPTER III. — The United States of America, ... 230
§ 1. General Observations, ... 230
2. District of Columbia, ... 232
3. Sections of the United States, ... 233
4–10. New England States, ... 234
11–16. Middle States, ... 244
17–26. Southern States, ... 253
27–41. States of the Interior, ... 264
42–47. Pacific States and Territories, ... 277
Exercises in Voyages and Travels, ... 285
CHAPTER IV. — Mexico, Central America, and West Indies, .. 286
§ 1. Mexico, ... 286
2. Central American States, ... 287
3. West Indies, ... 288
Exercises in Voyages and Travels, ... 289
CHAPTER V. — Political Divisions of South America, ... 290
§ 1. Inhabitants and Countries, ... 290
2. Venezuela, ... 290
3. New Grenada, ... 291
4. Ecuador, ... 291
5. Peru, ... 292
6. Bolivia, ... 292
7. Chile, ... 293
8. The Argentine Republic, ... 293
9. Uruguay, ... 294

10. Paraguay, ... 294
11. Brazil, ... 294
12. Guiana, ... 295
13. Patagonia, ... 295
Exercises in Voyages and Travels, ... 295
CHAPTER VI. — POLITICAL DIVISIONS OF EUROPE, ... 296
§ 1. Inhabitants and Countries, ... 296
2. Great Britain and Ireland, ... 297
3. The Netherlands, ... 299
4. Belgium, ... 300
5. France, ... 301
6. Switzerland, ... 301
7. Austria, ... 302
8. Prussia, ... 303
9. Germany, ... 304
10. Spain, ... 305
11. Portugal, ... 306
12. Italy, ... 306
13. Turkey, ... 308
14. Greece, ... 309
15. The Ionian Islands, ... 310
16. European Russia, ... 310
17. Sweden, ... 311
18. Norway, ... 312
19. Denmark, ... 313
Exercises in Voyages and Travels, ... 313
CHAPTER VII. — POLITICAL DIVISIONS OF ASIA, ... 314
§ 1. Inhabitants and Countries. 2. Turkey in Asia, ... 314
3. Arabia, ... 315
4. Persia. 5. Iran. 6. Afghanistan, ... 316
7. Beloochistan. 8. Hindostan, ... 317
9. Island of Ceylon, ... 318
10. Indo-China. 11. British Provinces, ... 319
12. Malacca. 13. Chinese Empire. 14. China, ... 320
15. Toorkistan. 16. Siberia. 17. Japan, ... 322
Exercises in Voyages and Travels, ... 323
CHAPTER VIII. — POLITICAL DIVISIONS OF AFRICA, ... 324
§ 1. Inhabitants and Countries. 2. North Africa, ... 324
3. Eastern Africa. 4. South Africa, ... 327
5. Western Africa, ... 328
6. Central Africa. 7. African Islands, ... 329

APPENDIX.

Table of the Number of Geographical Miles in a Degree of Longitude, under each Parallel of Latitude, according to the spheroidal Shape of the Earth, ... 331
Table of Heights of some Remarkable Points on the Earth, ... 332,–334
" " Lakes and Inland Seas, ... 335
" " Comparative Lengths of Rivers, ... 335
GLOSSARY, ... 336

INDUCTIVE LESSONS.

INTENDED AS ORAL EXERCISES BY THE TEACHER.

I. We often want to ascertain distances and heights, when neither foot-rule, yardstick, nor measuring tape is at hand. This deficiency in instruments may be supplied, in some degree, in various ways. Take a carpenter's rule, or a yardstick that is graduated into feet and inches, and measure off on the school room floor, or elsewhere, a rod in length, marking the extremes in some suitable manner. Then let each pupil determine for himself, by pacing it off, how many paces of his natural gait in walking are equal to one rod, or half a rod; also how many feet and inches are equal to *one of his paces.* Let this be practised until it becomes a ready means for measuring horizontal distances. Then ask one to ascertain the length of the school room, and another its width. Having previously determined for yourself the actual distances between a variety of objects or points in the vicinity of the school house, send out three or four pupils to pace off these distances, and report to you the result in rods, yards, and feet.

II. To measure heights and depths, let each pupil determine his own height in feet and inches, and then mark an equal height on the wall or fence. Taking his stand at some distance from the wall, let him fix his eye upon the space indicating his height, till he becomes familiar with it as a measure of altitude. Prove its utility by requiring him to determine the height of certain objects.

However well furnished your school room may be with surveyors' instruments, these ready means of measurement should not be neglected. It is well to teach young persons to be fertile in expedients. An anecdote may serve to show this. An engineer in the French service was unexpectedly called upon by his superior officer to determine the width of a certain river. He had no instruments with him, and the result must be given without delay. His reputation, nay, his office, was involved in the dilemma. Without the least perturbation of manner, he took his stand on the river's bank, carefully adjusted the fore-point of his chapeau in front of his left eye, and with this as his line of direction, he observed where the point of sight would fall on the opposite bank. Then keeping his head and body rigidly fixed, and making his left heel a centre of motion, he turned a quarter round; and noticing where that point of sight fell on his own side of the river, he marched up to it, counting his paces, and gave the width of the river.

III. We will now suppose that the learners are prepared to take a tour of survey. Let the scene of their first exploration be the school room. Select some object for a starting point, — your own desk, for example, — and ask, "How far is my desk from the nearest wall?" Let several measure the distance. In like manner determine the position of various other objects in the room, both with relation to your desk and to each other. Now inquire, "If I wish to make a picture or ground plan of our school room, so as to present each object and part in its natural size, how large a sheet of paper will be necessary?" They answer, "As large as the school room floor." "Right; but this is impracticable. I want to draw it on our blackboard, which, you see, is very much smaller in surface: how can it be done?" Some one answers, "By making the picture of each object smaller." "Very well: but in order to preserve a just proportion in the parts of the picture, it will be necessary to fix upon a scale of measurement. Let us take, as the unit of a scale, one inch to a foot. I will divide this horizontal line" (drawing it on the board) "into twenty-four or thirty-six inches, to represent twenty-four or thirty-six feet. Next, let this figure" (drawing it by the scale) "represent the outline of the school room floor." Having progressed thus far, direct some member of the class to take the crayon, and say, "Locate on the plan, and that by actual measurement, the teacher's desk, the table, the stove, or the door." Give each member of the class a chance to do something upon it. When completed, question them as to the details of the plan, to ascertain how far its purpose is understood. For example, (pointing to the location of the teacher's desk on the plan,) ask, "What is this?" "Your desk." "Why, no. This" (putting your hand on the desk itself) "is my desk." Some will then say, "It is a picture of your desk." "Yes; but my desk is very much larger than the picture; is it not?" "It is; but the picture is made small because the blackboard is not large enough for one of natural size." Pointing to the whole plan, — "Now, if you should meet with this or a similar picture when you are at home or elsewhere, of what would it remind you?" "Our school room." "Would you think of the room and its furniture as being small, like the picture?" "No, sir." "Why not?" "Because we know that it is much larger." This dialogue may be pursued further if desirable.

Now, as a practical application of this lesson, each one of the class should be required to make a plan (on paper) of some room in his own home, to be brought in for examination.

IV. The next lesson should embrace a wider field of observation. For this purpose, select some spot of twenty or thirty rods square. One having a variety of natural objects, as tree, rock, brook, or pond, would be preferable. Take the south side of the proposed field as a base line, and fix upon some point or object for the first station, or starting point, to which all others within the intended limits shall be referred. Let each pupil be provided with a memorandum book and pencil for taking "field notes."

Select the points for survey, and direct the pupils, each in turn, in pacing off the distances, and noting them properly in their field books. A measurement with a surveyor's chain should also be taken as a standard for determining the correctness of the measures by pacing.

On returning to the school room, let the class proceed to map out on the blackboard a plan of the survey from their notes. Fix upon some convenient scale of measurement by which to project the plan, and let all be done by the pupils, requiring each to do something, to prove that he knows something.

V. As another step in these preliminary exercises, place before the class a map of some place which they have not seen, but which is familiar to yourself. By questions and descriptions endeavor to awaken in their minds just ideas of the real scene.

Next, take a map of the township in which the school is situated, and beginning with the school house, lead the class to a right conception of the bearing and distance of the several parts of the town from the school house, so that, as they are sitting at their desks, they can point towards any place in town which you may mention.

An acquaintance with the town becomes the just basis for an acquaintance with the county, and the county with the state. Encourage the pupils in making plans and maps of their own surveys.

VI. QUESTIONS. — What towns lie next north, south, east, or west of *this* town? What other towns adjoin this town? Point towards each of the neighboring towns. If either of the neighboring towns does not join ours, by what are they separated? Is this a large or a small town? Are there any larger ones in this state? Is this town situated on high or low land? In what county is it? Name the adjoining counties. In what state is our county? In what part of the state? How far, and in what direction are we from the capital of this state? Do you know why it is called the capital? Are there any hills or mountains near us? Any valleys or plains? Any bodies of water? Are there any highlands in our state? If so, in what part of it? Describe them. What rivers has it? What lakes? What bays, capes, or islands? Point towards each one, as you name it. If you wished to go to sea, what course would you take? If you wanted to travel farther inland, what would be your direction? Would you be ascending or descending? Why?

By such exercises as these, adapted in each case to the peculiarities of location, the teacher should prepare his pupils for the pursuit of this study.

KEY TO THE SOUNDS OF THE MARKED LETTERS.

VOWELS.

1. Fāte,	Mēte,	Pīne,	Nōte,	Cūbe,	Tȳpe,
2. Făt,	Mĕt,	Pĭn,	Nŏt,	Tŭb,	Crÿstal,
3. Fȧre,	Thêre,	Marîne,	Môve,	Pûll,	Mÿrrh.
4. Fär,	Hër,	Bïrd,	Nör,	Für,	———
5. Fȧst,	Briẹr.	Ruịn.	Sȯn,	Ru̇le,	Böïl.
6. Fâll,			Actọr.	Sulphụr.	Böûnd.
7 Liạr.					Töŵn.

CONSONANTS.

ç soft — açid.
c̦ hard — c̦hasm.
ġ soft — ġiant, Ġenoa.
ḡ hard — ḡive, Berḡen.

au — in French,...............like ō — H*au*te.
eau — " " " ō — Bord*eau*x.
au — " Ger. It. Sp. Port., " öŵ — Jungfr*au*.
ei, ey — " German, " ī — L*ei*psic.
j — " French, " zh — Dijon.
j — " Spanish, " h — Juan.
j — " other languages, " y — Jungfrau.
x — " Spanish, " h — Xalapa.
zz — " Italian, " ts — Tacazze.

PART FIRST.

ELEMENTS OF PHYSICAL GEOGRAPHY.

CHAPTER I.

PRELIMINARY OBSERVATIONS.

"O Lord, how manifold are thy works! in wisdom hast thou made them all. the earth is full of thy riches." — *Ps.* civ. 24.

1. We read, in the Sacred Scriptures, that "In the beginning God created the heavens and the earth;" and that the earth, at first, was without form, and void; and darkness was upon the face of the deep. And God caused the waters to be gathered together unto one place, and the dry land to appear. He set lights in the firmament of heaven, to divide the day from the night, to give light upon the earth, and to serve for signs, and for seasons, and for days, and for years. He caused the earth to bring forth grass, and herbs, and trees; and created the fishes of the sea, the fowls of the air, the beasts of the field, the cattle, and every thing that creepeth upon the earth. And last of all, he created man, in his own image. "Thus the heavens and the earth were finished, and all the host of them."

2. At the present time, besides the myriads of plants and of the lower orders of animals, the earth is estimated to contain more than a thousand millions of human beings, scattered over its surface, divided into races, nations, and tribes, differing in external appearance, character, language, government, and religion.

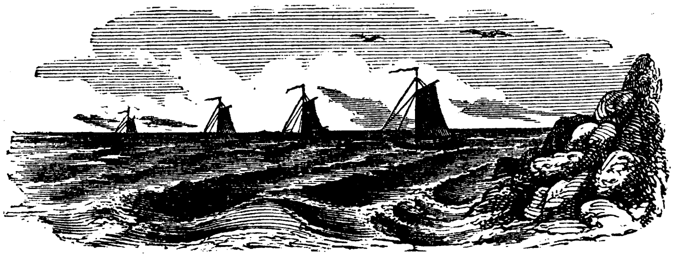
3. A knowledge of the form and dimensions of the earth constitutes a most important element in the science of geog-

---

Analysis. 1. Bible account of the creation. — 2. Present condition of the earth. — 3. Important element in the study of geography. Of first impresraphy. The first impressions of our senses are insufficient to give us a correct idea of the figure of the earth. To a spectator placed on an open plain, it seems to present the appearance of a flat or plane surface, equally extended in every direction, and terminated by a line in which the heavens seem to touch and rest upon it like a great dome.

4. It has long been known, however, that the form of the earth is that of a sphere or globe. Standing upon the sea-shore, we may observe the surface of the ocean terminated by a clear, well-defined line, or offing, as it is called, which is the visible horizon. If we embark in a vessel, and sail out of sight of the land, this offing will extend in a circle around us, of which our station in the vessel forms the centre. The appearance of this visible horizon, or sea offing, is owing to the convexity of the earth's surface.

5. This fact is exhibited by a vessel going from the shore and sailing beyond our visible horizon. The whole is visible till it reaches this water line. Beyond this, though the masts and sails still remain in sight, the hull of the ship is below the horizon. If the ship proceed a little farther, the lower sails disappear, and at length the whole is lost to view.



6. There are other proofs of the globular form of the earth — the daily apparent course of the sun from east to west; the constantly changing appearance of the starry heavens, to a person going from north to south, or from south to north; and the circular shadow of the earth on the moon in an eclipse.

7. A navigator, whose vessel continues to sail in the same general direction, (merely deviating from it so far as the intervening land renders necessary,) will eventually arrive at the place from which he set out. This practical proof of

---

sions. — 4. Form of the earth. The offing; to what owing? — 5. Proof of the convexity of the earth's surface. — 6. Other proofs. — 7. Proof by circumthe roundness of the earth was first accomplished by Ferdinand Magellan, who sailed from Spain in the year 1519, and whose vessel, by a continued westerly course, after an absence of about three years, arrived at the port from whence it started.

8. The mountains and valleys, the various elevations and depressions of the land surface, compared with the whole magnitude and form of the earth, are far less in proportion than the roughness on the rind of an orange. The highest mountain in the world, if represented on a globe of eighteen inches diameter, would be less than the eightieth part of an inch in height.

9. Physical Geography treats of the earth in its natural condition, drawing our attention to the diversities of its surface, as composed of land and water, of mountains, plains, and valleys; the phenomena of its atmosphere and oceans; with the distribution of plants, animals, and man over its surface. Physical geography may therefore be regarded as the foundation of the natural sciences, underlying them all, and supplying their materials for observation and study.

10. The earth is regarded as a solid body, regularly increasing in hardness, or density, from the surface towards its centre. Its surface, or crust, consists of a great variety of substances of different densities, some of which occur in shapeless masses; others are disposed in regular layers, or strata, either horizontal or inclined.

11. Man has penetrated but a very little way into the earth, by digging wells, or by mining; but, by reasoning from the inclination of the strata at or near the surface, and from other circumstances, he has obtained a tolerably accurate idea of its structure, to the depth of about ten miles.

12. The various forms, and the relative positions of the land and water surfaces, though apparently characterized by great irregularity, are not the result of mere chance or accident, but were planned and designed by the almighty Architect of the universe, to act in harmony.

> "All are but parts of one stupendous whole,
> Whose body nature is, and God the soul."

---

navigation. Who first gave this proof? — 8. Proportionate magnitude of mountains, &c. The highest mountain. — 9. Definition of physical geography. — 10. The earth, how regarded? Condition of its crust. — 11. Knowledge of its structure. — 12. Remark on the forms and relative positions of the land and water. Quotation. What has God established and caused?

He has established the proportions between the land and water, and the desert, just as they are, and has made the capacity of the air to circulate heat and moisture just what it is, that each and all may do their work in obedience to law, and in subservience to order. He "measured the waters in the hollow of his hand, and comprehended the dust in a measure, and weighed the mountains in scales, and the hills in a balance."

CHAPTER II.

THE CONTOURS OF LAND AND WATER.

"The sea is his, and he made it; and his hands formed the dry land." — *Ps.* xcv. 5.

13. The best representation of the earth, as a whole, is an artificial terrestrial globe, which shows on its surface a cŏn-tôur′ or outline of the various geographical regions, the continents, the peninsulas, and the islands, in their relative situations. A map of the world displays the hemispheres on a plane surface.

14. If we divide the globe into hemispheres by the meridian of Ferro, — one of the Canary Islands, — we shall perceive that land predominates in the eastern hemisphere, and water in the western. In the hemispheres divided by the equator, the land is more extensive in the northern than in the southern.

15. Another division of the globe into hemispheres, by taking London, in England, as the centre of the northern one, and Antĭp′ọdēs Islands, south-east of New Zealand, as the centre of the southern, will exhibit the most extensive important masses of land in the former, which may be called the land hemisphere, and in the latter the greatest collections of water, which is the water hemisphere.

16. Hence we find that the land and water on the surface of the globe are very unequally distributed, the water occupying nearly three fourths of the whole.

17. The dry land appears in various detached portions in the midst of the oceans, and may be considered in two classes — Continents and Islands.

18. A Continent is a portion of the earth's broken crust, which has been elevated from the bottom of the ocean to a certain height above its surface, presenting to view a large

---

13. Best representation of the earth. — 14. Comparison of the eastern and western hemispheres. Of the northern and southern hemispheres. — 15. Of the land and water hemispheres. — 16. Distribution of land and water. — 17. Two classes of lands. — 18. Continent defined. Relief. Contour. Rela-

body of irregular shape, limited in its outline by the sea. This elevation of the land above the level of the sea is called the relief, and the shape of its horizontal outline is the cŏntôur′. A few feet, more or less, of elevation above the level of the sea, would entirely change the outline. The physical position of a place, or its elevation in the atmosphere above the level of the sea, is an element of as much importance in regard to its climate, vegetation, and other circumstances, as its geographical position with regard to the equator.

19. The Eastern Hemisphere, or Old World, comprises four continents, viz., Asia, Europe, and Africa, which, being connected together, are commonly spoken of as the Great Eastern Continent; and Australia, which lies detached.

20. The Western Hemisphere, or New World, comprises the two continents of North and South America, with the small division of Central America uniting them. The whole is called the Great Western Continent.

21. The lands about the north pole are denominated the Arctic Regions, of which Greenland is the most extensive portion.

22. A newly-discovered continent has been found to exist within the Antarctic circle. The honor of this discovery belongs to Commander Wilkes, of the United States Exploring Expedition, who first saw it on the 16th of January, 1840.

23. An Island is a body of land less than a continent, and is entirely surrounded by water. The innumerable islands of the oceans and seas may be classed under two heads, viz., Continental, and Pelă′gic.

24. Continental islands are long in proportion to their breadth, and follow each other in succession along the margin of the continents, as if they had been formed during the elevation of the main land, or had afterwards been separated from it by the action of the sea, and still mark its ancient boundary. They generally run parallel to the maritime chains of mountains, and are mostly of the same structure.

25. On the north-west coast of America there is a long chain of these islands, of which Vancouver's Island is the largest. Another range occurs along the west coast of Pătagō′nia. Great Britain, with the Hĕb′ridēs, Ŏrk′ney, and

---

tive importance of physical and geographical positions. — 19. Continents of the eastern hemisphere. — 20. Continents of the western hemisphere. — 21. The Arctic regions. — 22. The Antarctic regions. — 23. Define an island. Classes of islands. — 24. Of continental islands. — 25. Give examples. —

Shĕt′land Islands, are remarkable instances of continental islands. Another vast chain of continental islands extends along the coast of Asia, from Fŏrmō′sa to Kamtchăt′ka.

26. Pelă′gic islands have risen from the bed of the ocean, independently of the continents, and are generally far from the main land.

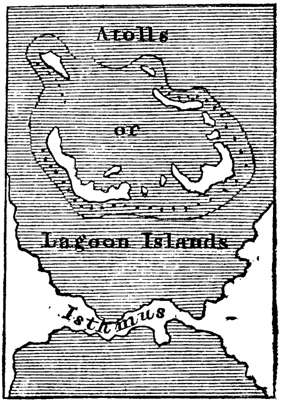
27. They are mostly volcanic, altogether or in part; often very lofty; sometimes single, and frequently in groups.

28. In the Atlantic, the Islands of Tristăn′ d'Acŭn′ha, St. Helē′na, Ascension, and Madêi′ra are of volcanic origin. The Cape Verd′, Canā′ries, and Azōres′ have each active volcanoes.

29. It is supposed that the great circuit of islands beginning with New Zēa′land, and extending through Nŏr′folk, New Caledō′nia, New Hĕb′rides, Sŏl′omon's, New Brĭt′ain, New Hăn′over, New Ire′land, Louisiăde′, and New Guĭn′ea once formed the eastern and northren boundary of the Australian continent; and that the whole Indian Arçhipelago is but the wreck of a continent which has been ingulfed by the ocean.

30. All the smaller tropical pelă′gic islands, in the Pacific and Indian Oceans, are either of volcanic or cŏr′alline formation, except New Caledonia and the Seyçhĕlles′.

31. The islands of cŏr′alline formation are the work of cŏr′al insects, which exist in incalculable numbers, chiefly in the tropical parts of the Indian and Pacific Oceans.



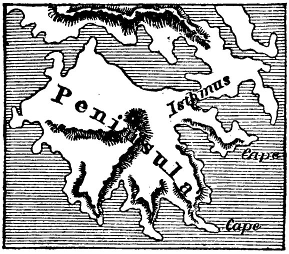
32. These insects cannot live if left dry, nor at a greater depth than one hundred and fifty to one hundred and eighty feet; hence all the cŏr′al above the surface of the water is dead, and that below the depth mentioned is also dead. Circular reefs of cŏr′al formation rising out of the sea and enclosing a lagoon′, are called Atolls′.

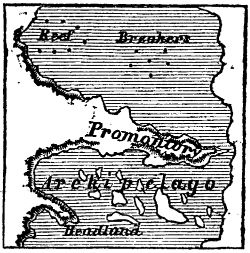
33. Those parts of a continent running out into the sea considerably beyond the general coast line are called Peninsulas, being almost surrounded by water,

---

26. Of pelagic islands. — 27. Their origin and occurrence. — 28. Examples. — 29. Supposition concerning the Australian islands. — 30. Formation of the smaller tropical pelagic islands. — 31. Of coral insects. — 32. Limit of their

as Italy, Spain, Florida. The peninsular form is a very common feature of the land.





34. A narrow neck of land connecting two large masses is denominated an ISTHMUS, as the Isthmus of Panamä′, which unites North and South America.

35. The extremities of peninsulas, or any points of land projecting beyond the coast line into the sea, are variously named capes, promontories, points, and headlands.

---

operations. Atolls. — 33. Peninsulas. — 34. Isthmus. — 35. Of projections beyond the coast line.

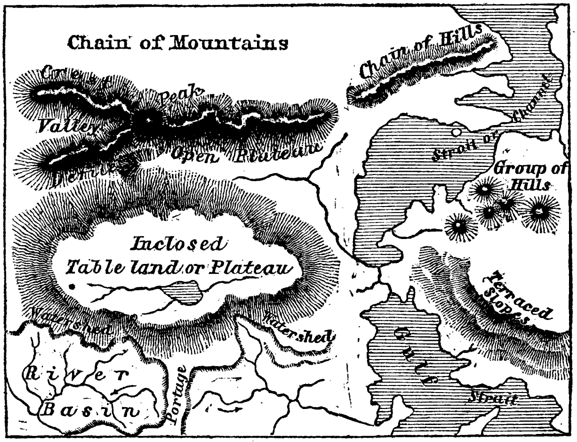
CHAPTER III.

THE RELIEFS OF THE LAND SURFACE.

> "Whatsoever the Lord pleased, that did he in heaven, and in the earth, in the seas, and in all deep places." — *Ps.* cxxxv. 6.

36. THE FORMS OF RELIEF on the globe are varied to an almost infinite extent; yet they may be classified, according to their most prominent features, into mountains, or highlands; plateaus, or table lands; and plains, or lowlands.

37. MOUNTAINS are vast elevations of land, either connected in lines or ranges distributed over the surface, and on the borders of plains and plateaus, or scattered in isolated groups, or forming the centre or knot of several chains.



38. In a system of mountains the central ridge has usually the boldest development and the highest elevation. The highest part of a range is called the crest.

39. From its common occurrence it seems to be a general

---

36. Forms of relief. — 37. Mountains. — 38. The crest. — 39. General law

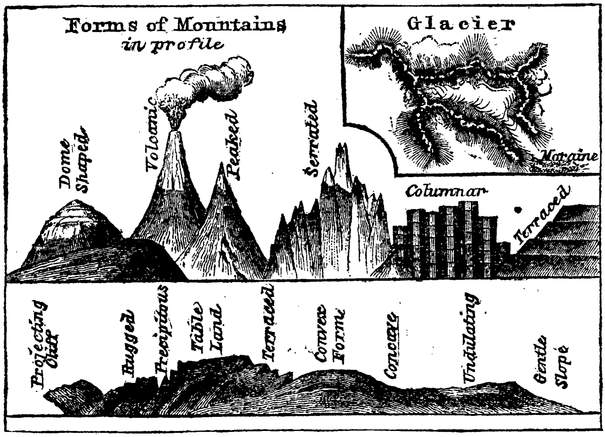
law for chains of mountains to have very steep declivities on one side, and very gradual slopes on the other. The An′dēs present a steeper face towards the Pacific Ocean than towards the main land of America; and generally the steepest declivity is towards the nearest sea.

40. Chains of mountains, though making many curves and angles, generally follow the direction of the greatest length of the continent or district in which they are situated.

41. Mountains which reach the height of 10,000 feet and upwards are of the first class; those ranging between 4000 and 10,000 feet are of the second class; those varying from 2000 to 4000 feet are of the third class; and the inferior elevations are styled hills and slopes.

42. Parallel chains having the same general direction, though separated by valleys, straits, or seas, resemble each other in geological formation; as the Atlas and Spanish mountains.

43. Terraces are successive steps of descent from highlands to lowlands. A Watershed is the sloping of the land in several directions, determining the course of the flowing waters. The space enclosed by a watershed is called a Basin, the lowest part of which is generally occupied by a lake, or traversed by a river.



---

for mountain chains. Relation of the slopes to the ocean. — 40. Direction of mountain chains. — 41. Height of first class mountains; second class; third class. Inferior elevations. — 42. Resemblance of parallel chains. — 43. Ter-

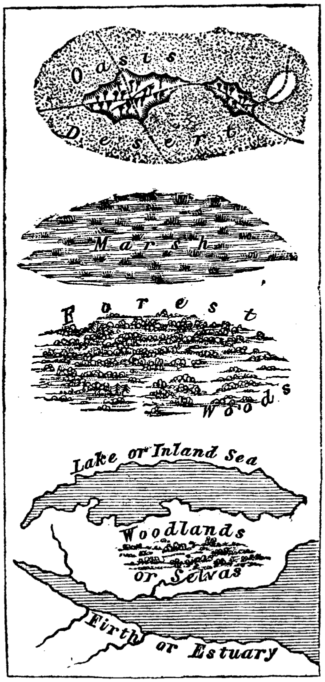
44. Mountain forms differ in appearance, and are described as being dome-shaped, volcanic, peaked, ser'rated, (jagged like a saw; hence the Spanish name sierra,) or colum'nar. This difference is owing to their geological structure.

45. Plateaus. An extensive mass of elevated land, with comparatively level surfaces, is called a plateau, or table land. It may have various undulations of hill and vale, be traversed by mountain ridges, and serve as a platform for lofty peaks; but its prevailing character is that of a highly-raised region on which there is a considerable area of plain surface; the whole presenting either gradual slopes, or abrupt acclivities, and sometimes terrace-shaped sides, to the adjoining lowlands.

46. Plains are distinguished from table lands by being very little elevated above the sea, in some instances even descending below it. The term is applied to an extent of country generally level as compared with mountainous districts, though the surface may be undulated, studded with low hills, traversed by valleys, or intersected by deep ravines. Plains constitute by far the greater portion of the earth's surface, and are the sites of its highest culture, greatest cities, and most numerous population.

47. Plains, though possessing certain features in common, present some peculiarities, as follows: —

48. *Landes*, or *Heaths*. These occupy a large portion of the north of Germany and the south-west of France. They are sandy tracts, sometimes wholly bare, or clothed with heath and pines, interspersed with fens and marshes.



races. Watershed. Basin. — 44. Varieties of mountain forms. — 45. Plateaus; their prevailing character. — 46. Of plains; extent. — 47, 48. Peculi

49. *Stĕppes.* The Russian term stĕppe is applied to the extensive plains which occupy South-eastern Europe and North-western Asia. These have no uniform character, except that of being great lowland levels.

50. *Deserts* are tracts of bare sand, gravel, rocky slabs, and flinty stones, condemned to perpetual barrenness. Depressions of varying extent occur in the midst of the deserts, called Ō′ases, where there are springs and wells, nourishing groves of date trees and grasses.

51. *Llä′nos.* The plains of Venezuē′la and New Grenä′da, in South America, are so called. In the wet season they are inundated for hundreds of square miles; afterwards, when the waters have subsided, they are covered with a beautifully green verdure; and in the dry season the grass crumbles into dust, the whole appearing like a desert.

52. *Sĕl′vas.* The plains of the Amazon, in South America, are covered with woods, interspersed with clear, grassy spaces and marsh lands. They comprise upwards of two million square miles, nearly one million of which is woodland.

53. *Păm′pas.* These form the third great division of South American lowlands, extending about eighteen hundred miles south from the selvas, and from the Atlantic to the Andes. They are treeless plains, covered with tall grass, thistles, &c., presenting also vast swamps and lagôons′.

54. *Savăn′nas,* or *Prāi′ries.* These are apparently boundless meadows, occupying vast tracts on both sides of the Mississippi, but principally on the west. They are described as undulating, or rolling, in the general aspect of their surfaces.

55. VALLEYS are of three kinds — principal, lateral, or transverse, and subordinate. Principal valleys are usually of large dimensions, enclosed between extensive parallel ranges of mountains. To this class belongs the Valais, or Valley of the Rhone. Lateral valleys are so called because they are situated among transverse branches of mountain ranges. Subordinate valleys are of smaller size, formed by the spurs of mountain ranges, or situated among hills.

— Some valleys are basin-shaped, being surrounded by a girdle of mountains, with the exception of one small outlet, which allows the escape of the surplus waters. The beautiful valley of Cashmere′ presents an example of a basin-

---

arities. Landes. — 49. Steppes. — 50. Deserts. Oases. — 51. Llanos. — 52. Selvas. — 53. Pampas. — 54. Savannas, or prairies. — 55. Three kinds of valleys. Principal; example; lateral; subordinate. Basin-shaped; valleys exshaped valley. When valleys are narrow and difficult of access, they are termed ravines, glens, dells, defiles, gorges, gullies, passes, or ports. These are frequent among steep mountains, and often present scenes of great beauty and grandeur. They usually form the routes by which mountain chains are crossed, and often form the beds of rivers. The "Notch" in the White Mountains of New Hampshire affords an instance.

56. In high northern and southern latitudes, and at certain elevations in all latitudes, snow and ice occur on the surface of the globe as a permanent covering.

57. The snows accumulated on the tops and steep declivities of mountains are frequently precipitated, by their own weight, into the valleys below. These ăv′alanches often occasion great destruction in their course.

58. Glă′ciers, masses of ice, or of ice, snow, and water, are remarkable appendages of the snow fields. They appear like frozen torrents hanging upon the sides of mountains, and extending from the higher summits into the lower valleys.

59. The size of glă′ciers sometimes amounts to fifteen or twenty miles in length, and three miles in breadth, the thickness at the lower portion varying from eighty to one hundred, or even two hundred feet. The front is melting, while above it accumulates and is consolidated; hence it is moving along the ground, advancing down the mountain slope, faster or slower, according to the season and the degree of heat.

60. Volcano. This is a term denoting a peculiar class of mountains emitting from their summits or sides melted mineral masses, with columns of flame, smoke, and ashes. Their general form is conical, with a hollow at the summit, called the crater, or cup.

61. The volcanic mountains are either continuously active, or intermittent, or extinct. Strŏm′boli, one of the Lĭp′ari Islands, is an example of the active; Mount Etna, on the Island of Sĭ′cily, the intermittent; and the Isle of Päl′ma, one of the Canā′ries, the extinct, or third kind.

62. Earthquakes and Volcanic Eruptions are undoubtedly phases of the same phenomenon. Earthquakes are most abundant and violent in countries which surround or lie between volcanic districts. No phenomena are so terrible

---

ample. Valleys when narrow and difficult of access. — 56. Permanent snow and ice. — 57. Avalanches. — 58. Glaciers. — 59. Their extent and progress. — 60. Volcano; general form. — 61. Classes and examples. — 62. Earthquakes;

in their effects, or so fatal to man. They commence without the slightest warning; the shocks follow in quick succession, the first or second being usually the most tremendous; and almost at the same instant a vast extent of country is involved in disaster from these movements.

63. The phenomena of earthquakes comprise the permanent displacement of large areas of land by elevation and depression, the opening of extensive fissures, great oceanic waves, and a train of varying incidents dependent upon the situations and strength of the shocks.

AN OUTLINE OF GEOLOGY.

Geology treats of the nature and arrangement of the various rocks and other substances at or near the surface of the earth. The term *rock* includes the loose sands, clays, and gravels, as well as the more compact and solid portions of the globe.

An examination of the earth's crust shows us that it is formed of numerous beds, or strata, of rocks; some of limestone, some of sandstone, some of clay; some very hard, others soft and crumbling, and easily worn away by the action of running streams, or the waves of the ocean. The greater number of these beds contain *organic remains*, that is, the remains of animals and plants, which are termed *fossils*. Among these the most numerous are the remains of marine animals. In some instances shells and corals occur in such abundance as to form the principal part of extensive beds. Every part of the earth exhibits similar, or nearly similar, formations; and not only are marine fossils met with in the interior of continents, and at great elevations above the sea, but a vast variety of plants, corals, shells, fish, reptiles, &c., are found in a fossil state of species unlike any existing at the present time.

Besides rocks, we meet with *earthy* formations on the surface. These include such loose materials as are worn away from rocks, and form, when combined with decayed animal and vegetable matter, the soil of meadow and arable lands, and, chiefly, all beds which are not hardened. *Water-worn pebbles*, that is, fragments of rock, rounded by friction and the action of water, are of frequent occurrence, forming *gravel* in the beds of rivers, and *shingles* on the sea shore. When these rounded fragments are of very large size they are termed *boulders*.

When rounded pebbles become cemented together by lime, or any other material, so as to form a solid rock, the mass is called *conglomerate*, and sometimes *pudding stone*. *Angular* fragments thus cemented are known by the name of *breccia*.

---

where common. Characteristics. — 63. What do the phenomena of earthquakes comprise?

Of the fifty-four elementary or simple substances, that is, those which are incapable of further analysis, *sixteen*, by their various combinations, form nearly the whole of the matter composing the globe. These are arranged in three classes, as follows, the first in each class being the most abundant: Six *metalloids*, or bases of the earths and alkalies — silicum, aluminum, potassium, sodium, magnesium, and calcium. Two *metals* proper — iron and manganese. Eight *non-metallic* substances — oxygen, hydrogen, nitrogen, carbon, sulphur, chlorine, fluorine, and phosphorus. These elementary substances are rarely found separate in nature, but are combined with each other, forming the simple minerals, of which *eight* or *nine* constitute the great mass of all known rocks: quartz, felspar, mica, hornblende, carbonate of lime, talc, chlorite, augite, and serpentine.

Sometimes the simple minerals exist in large, independent masses, as quartz and carbonate of lime; but in general two, three, or four are united to form a rock; thus quartz, felspar, and mica constitute the *granite* rock.

The beds or layers of rock which compose the crust of the globe are of two kinds: —

1. The *Massive* or unstratified rocks, which underlie all the others, or have sometimes been forced up through them. They appear to have been once in a melted state, and on cooling at the surface, formed the original crust of the globe. Granite, porphyry, basalt, and lava belong to this division.
2. The *Sedimentary* or stratified rocks, which have been formed by successive deposits in water. These sediments have been derived partly from the disintegration of the older rocks, and partly from the decay of plants and animals. They include limestones, sandstones, slates, and marls.

These divisions are usually arranged by the geologist into four great classes, namely: plutonic, volcanic, metamorphic, and aqueous, so named from the manner in which they have been produced.

PLUTONIC ROCKS consist of masses which, while in a melted state, were gradually cooled and consolidated at an immense depth, under enormous pressure, and then upheaved by the elastic force of internal heat. Granite, and its varieties, with some pŏr′phyries, belong to this class. They contain no organic remains, that is, petrifactions of vegetables or animals.

VOLCANIC ROCKS are the produce of ancient volcanic eruptions. They were mainly consolidated at or near the surface of the earth, with a less degree of pressure than the plutonic — a circumstance that has a marked effect upon their appearance and structure. They have also a more diversified character, the volcanic fire having melted different kinds of strā′ta in its eruptions. The basâlts′, greenstone, trā′chyte, and various pŏr′phyries belong to this class. They are frequently called "trap rocks," because of their frequent arrangements in the form of steps. They have no organic remains.

METAMORPHIC ROCKS are of sedimentary origin, but having been in contact with the plutonic while in a melted state, they have been altered in their texture, and crystallized by the action of the intense heat. The gneĭss, mīca-schĭst, and part of the clay-slate systems belong to this class. They have no organic remains.

AQUEOUS ROCKS are those which are entirely due to the action of water, either having been deposited as mere sediment by its mechanical agency, or as chemical precipitates from solution. Formations of this class constitute by far the greater portion of the crust of the globe. They all contain organic matters, and form ten principal subdivisions or groups, as follows: —

1. The *Lower Silurian*, which is a very extensive formation, composed of various limestones and sandstones.

2. The *Upper Silurian*. It is also extensive, and exists in different parts of America, Europe, and Africa.

3. The *Devonian*, sometimes called the *old red sandstone*, occurs in Russia, England, Scotland, and North America.

4. *Carboniferous* system; embracing the mountain limestone and the coal measures. It abounds in Great Britain and the United States, and is found in France, Belgium, Saxony, Bohe′mia, Westphā′lia, on the north of the Carpā′thians, in Rŭssia, Syria, the basin of the Indus, in China, and Australia.

5. The *Trias*, or *Saliferous* formation; consisting of variously-colored marls, sandstones, and magnesian limestones, with masses of rock salt. It appears in midland England, central Europe, and composes many of the river valleys of the United States.

6. *Oolit′ic* system; a collection of clays and limestones of various shades, the latter containing small calcareous globules, resembling the eggs of a fish — hence the name ō′olite. It appears in England, and various parts of Europe.

7. *Cretā′ceous* system; comprising green sands, chalk marl, and chalk, with nŏdules of flints. It is found in the eastern and southern counties of England, spreads over wide areas of France and Germany, and occurs in North America.

8. The *Lower Tertiary*, or *Eocēne*, very abundant in the Southern United States; and the coarse limestone of Paris, and the London clay in England, belong to it.

9. The *Upper Tertiary*, or *Miocene*, and *Pleiocene*. This is also found in the United States, in South America, and in Southern Europe.

10. The *Drift*, forming the most superficial deposits, and extending over a large portion of the northern countries of both continents.

Each formation represents an immense period of time, during which the earth was inhabited by successive races of animals and plants, whose remains are often found, in their natural position, in the places where they lived and died, not scattered at random, though sometimes mixed together by currents of water, or other influences, subsequent to the time of their interment. From the manner in which the remains of various species are found associated in the rock, it is easy to determine whether the animals to which these remains belonged lived in the water or on land, on the beach or in the depths of the ocean, in a warm or in a cold climate.

The plutonic and volcanic rocks exhibit generally irregular masses, without divisional structure, but broken by fissures, the summits being dome-shaped, globular, or deeply serrated ridges.

The metamorphic and aqueous rocks, on the contrary, are disposed in the form of beds, layers, or strāta, both horizontal and inclined at all angles to the horizon. The plains and low portions of the earth are occupied almost universally by stratified rocks. They appear also in elevated districts, and on the flanks of mountainous regions. The strāta vary in thickness from a few inches to many yards.

If the rocks of deposition had been formed in quiet waters, and kept free from disturbing forces, the position of layers would have been uniformly horizontal. But this has not been the case, and consequently layers are generally found to dip towards some point of the horizon. They have sometimes been lifted into a vertical position, or variously curved and contorted by the disturbing force.

Geology, then, has established this fact, that at different periods of action among the subterranean fires, the unstratified masses which constitute the basis of the earth's crust have been repeatedly forced through and into the stratified formations, causing their various dislocations, their disturbed and inclined positions, their upheaval above the deep in which they were deposited, and frequent elevation along the flanks and on the crests of high mountain ranges.

CHAPTER IV.

THE WATER SURFACE OF THE EARTH.

"All the rivers run into the sea, yet the sea is not full; unto the place from whence the rivers come, thither they return again." — *Eccl.* i. 7.

64. Springs. The vapor which is constantly rising from water surfaces, and from wet or moist land, ascends into the atmosphere till it is condensed by cold into clouds, which again restore it to the earth in the forms of rain, hail, and snow.

65. Part of the moisture thus restored to the earth rises again in vapor; part supplies the wants of animal and vegetable life; a portion is carried off by the river streams, and the remaining part penetrates the porous soils till it reaches an impervious rock or clay bed, where it accumulates in vast reservoirs, from which it issues in springs at the surface of the ground, becoming the sources of rivers and lakes.

66. All spring waters contain some solid matter in solution, either saline or mineral: when this is in excess, they are called mineral springs. (See *Glossary.*)

67. Thermal or hot springs occur in almost every region of the globe. The boiling springs of Iceland are well known. The Great Gey̆'ser shoots up vast columns of boiling water to the height of ninety or one hundred feet.

68. Rivers frequently have their origin in lakes which they discharge into the sea. In other instances they spring from small elevations in the plains, from never-failing sources in the mountains, as alpine lakes, melted glacial ice and snow; but the chief sources of the mightiest rivers are the ice-clad mountains of high table lands. These perpetual storehouses of the waters send their streams to refresh the plains, and to afford a highway between the nations.

69. A river basin includes, besides the bed actually occu-

---

64. Springs. Vapor. Clouds. Rain. Hail. Snow. — 65. Disposition of the moisture which falls to the earth. — 66. Mineral springs. — 67. Thermal springs. — 68. Origin of rivers. — 69. Extent of river basin. — 70. The dividing line of

pied by the water, the whole of the declivities from which its tributaries descend.

70. The country which divides one basin from another is called the WATERSHED. This is sometimes a lofty range of mountains; but very commonly a watershed has no great elevation, a slight convexity being sufficient to produce distinct systems of drainage.

71. Where the watersheds are low, rivers are often united, in civilized countries, by canals, promoting navigation.

72. The form of the channel, the slope of the bed, and the volume of water, are the elements upon which the velocity of rivers depends.

73. A slope of one foot in two hundred in the bed of a river renders it unnavigable; a greater inclination produces a rapid; and one still greater, approaching the perpendicular, a cataract. Every river carries down mud, sand, or gravel, to the sea. The Ganges brings more than 700,000 cubic feet of mud every hour; the Hoang-Ho, in China, 2,000,000, and the Mississippi still more. The solid matter thus brought down and deposited by streams is called alluvium by geologists.

74. Rivers depend for their magnitude upon various elements, as the length of their course, the extent of their basins, the rain-producing character of the climate, and connection with snow-clad mountains.

75. An inlet of the sea connected with the mouth of a river is called a Firth, or Estuary. They are common in Scotland.

76. The coasts of Norway, Greenland, Iceland, and the west coast of Patagonia and Chi′le, are rent into chasms, or fiords, which are either partly or entirely filled by arms of the sea.

77. LAKES. The water of lakes is derived either from rivers or from springs. Small lakes occur in mountain passes, formed by water which runs into them from the surrounding peaks. Large lakes are common on table lands and in valleys of mountainous countries; but the largest are on extensive plains.

78. Four classes may be made of lakes, founded upon their physical differences:—

a. Those which have no apparent affluents, or outlets.

---

one basin from another.—71. Means of uniting rivers under certain circumstances.—72. Velocity of current depending on what?—73. Degrees of slope. Alluvium.—74. Magnitude of rivers depend on what?—75. Firth or estuary. —76. Fiords.—77. Formation of lakes.—78. Number of classes. 1st class.

These are generally small, but, being fed by subterraneous springs, are more permanent than larger lakes.

b. Those which have an outlet without any visible affluents.

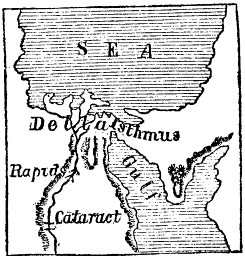
c. Those which receive affluents without having any visible outlets. These are common in Asia: the most remarkable examples are the Căs′pian, the Ar′al, and the Dead Sea.

d. Those which have both affluents and an outlet. Among the fresh-water lakes these are the largest and most numerous; as the Great Lakes of North America, Ladō′ga in Europe, Baī′kal in Asia, and Tchăd in Africa.

79. Lakes are not subject to tides, and many of them never freeze, on account of their great depth.

80. The highest lakes are the Sirikol′, in Central Asia, 15,600 feet above the level of the sea; Mansarowâr′, in Tībet′, 15,256 feet; Lake Titicä′ca, in South America, 12,846 feet; Lake Trüb, in Switzerland, 7200 feet; and Lake Superior, in America, 672 feet elevation. There are some remarkable bodies of water that are below the level of the ocean. The Caspian Sea is 83 feet, Lake of Tibē′rias 329 feet, and the Dead Sea 1312 feet lower, than the surface of the Mediterranean.

81. OCEANS. The vast expanse of waters which surround the continental and island masses is, in a general sense, denominated the sea; but it is usually considered as divided into several great sections, or oceans, known as the Arctic, the Atlantic, the Indian, the Pacific, and the Antarctic Oceans.



82. Branches of the ocean extending into the land are variously denominated seas, gulfs, bays, bights, or inlets. Passages which connect different bodies of water are called straits, channels, or sounds.

83. *The Arctic basin* is limited by the northern shores of America, Europe, and Asia; and, in the spaces between the continents, the Arctic circle is usually considered as the boundary. The chief branches of the Arctic Ocean are Băf′fin's Bay, the White Sea, Sea of Kär′a, Gulf of Ō′bi, and Bēhr′ing's Straits.

84. *The basin of the Atlantic* lies between America on the

2d class. 3d class. 4th class. — 79. Of tides in lakes. — 80. Examples of remarkable elevation and depression of lakes. — 81. Use of the term sea. The oceans. — 82. Branches of an ocean. Straits, &c. — 83. The Arctic Ocean. Branches of the Arctic. — 84. The Atlantic basin. Branches of the Atlantic.

west, Europe and Africa on the east, and the polar circles on the north and south. The principal branches of the Atlantic are the Bâl′tic Sea, with its gulfs, the North Sea, the Mediterranean and Black Seas, Gulf of Guĭn′ea, the Carĭbbē′an Sea, Gulf of Mexico, Gulf of St. Lawrence, and Hudson's Bay.

85. *The basin of the Indian Ocean* has for its boundaries Africa on the west, Persia and Hindostän′ on the north, the Sŭn′da Isles and Austrā′lia on the east, and the Antarctic circle on the south. The chief branches of the Indian Ocean are the Red Sea, the Arabian Sea and Persian Gulf, and Bay of Bengâl′.

86. *The basin of the Pacific* is enclosed between America on the east, Asia and Australia on the west, the Aleū′tian Islands on the north, and the Antarctic circle on the south. The principal branches of the Pacific Ocean are the Chī′na Sea, Yĕl′low Sea, Sea of Japăn′, Sea of Okhŏtsk′, Sea of Kamtchăt′ka, Gulf of Califŏr′nia, and Bay of Panamä′. The *Antarctic basin* embraces that portion of the southern seas which is circumscribed by the Antarctic circle.

87. The ocean bed exhibits inequalities similar to those which mark the surface of dry land — abrupt eminences, gentle slopes, and deep depressions. Off a low, level, and sandy shore the sea is, in general, shallow for a considerable distance, but very deep close to a bold, towering coast.

88. There is at the bottom of the sea, between Cape Race, in New′foundlănd′, and Cape Clear, in Ireland, a remarkable steppe, which is already known as the telegraphic plateau. It is proposed to open a telegraphic communication between America and Europe, by laying the wires along this plateau from the eastern shores of New′foundlănd′ to the western shores of Ireland. The great circle distance between these two shore lines is 1600 miles, and the sea along the route is probably nowhere more than 10,000 feet deep. It was upon this plateau that Brooke's sounding apparatus brought up its first trophies from the bottom of the sea, a depth of more than two miles. The specimens were examined by Professor Bailey, of West Point. He found them to be microscopic shells, without a particle of sand or gravel in them, and perfect in their forms.

89. The water of wells, springs, rivers, marshes, and lakes is for the most part fresh; but the ocean waters are salt. The

---

— 85. Basin of the Indian Ocean. Branches. — 86. Basin of the Pacific. Branches. The Antarctic basin. — 87. The ocean bed. Law of depth off shore. — 88. The "telegraphic plateau." Brooke's sounding apparatus. 89. Of fresh saline ingredients render sea water more dense than fresh water, and consequently more buoyant and better adapted for navigation. Fresh water freezes at a temperature of 32°; salt water freezes at 28½°.

90. The mean temperature of the ocean at the surface diminishes from within the tropics as the latitude increases, till, towards the poles, the sea is ice-bound. The line of greatest warmth at the surface does not coincide with the geographical equator, but runs on the north of it.

91. The waters of the ocean exhibit various hues, which depend upon a variety of circumstances. Its general color is ultramarine blue; but every gleam of sunshine, passing clouds, winds, shoals, and sand banks affect its tints. Particular parts of the ocean show peculiar colors, which are occasioned by differently-colored animalcules. The sea is white in the Gulf of Guĭ'nea, and black amid the Maldîve' Islands. Variously purple, red, and rose-colored waters occur in the higher parts of the Mediterranean, in the Vermilion Sea off California, the Red Sea, and in tracts along the coasts of Chî'le, Brazil', and Austrā'lia. Green water appears in the Persian Gulf, off the Arabian coast, and in connection with the deepest blue of the Arctic Ocean.

Questions for Map Exercises on the Oceans and their Branches.

92. Which are the principal branches of the Atlantic in the northern portion of North America?

What are the two branches between North and South America?

What passages lead into each?

What branches has Băf'fin's Bay? Hŭd'son's Bay? The Gulf of Mexico? The Caribbē'an Sea?

Name the principal branches of the Atlantic on the eastern coast of the United States. Branches on the coast of South America.

Name the chief branches of the Atlantic which penetrate Europe and Africa.

What passages lead into each?

What branches has the Bâl'tic Sea? The North Sea? The Irish Sea?

What are the northern branches of the Mediterranean Sea? Its southern branches?

What southern strait connects the Atlantic with the Pacific?

---

and salt waters. Freezing temperature of fresh and salt water.—90. Mean temperature of the ocean. Warmth at equator.—91. Hues of the ocean.

What branches has the Pacific on the western coast of South America?
What bays, sounds, and gulfs on the western coast of North America?
What passage leads from the Pacific into the Arctic Ocean?
What branches of the Pacific on the eastern coast of Asia?
What branches has the China Sea?
What passages unite the Pacific and Indian Oceans?
What gulf in the north of Australia?
Which are the two great branches of the Indian Ocean extending into Asia?
What branches penetrate Africa?
What branches has the Red Sea?
What passage leads into the Red Sea?
What branches has the Arabian Sea?
What gulf west of In′do-Chi′na?

CHAPTER V.

MATHEMATICAL AND ASTRONOMICAL ELEMENTS.

"Where wast thou when I laid the foundations of the earth? declare, if thou hast understanding. Who hath laid the measures thereof, if thou knowest? or who hath stretched the line upon it?" — *Job* xxxviii. 4, 5.

93. In Mathematical Geography we consider the earth in the relation it sustains to the sun, moon, and stars, with the methods of representing its surface by globes, maps, &c., and of determining extents on its surface. We begin with explaining some geometrical terms.

94. *Lines* are either straight or curved. A straight line is the shortest distance between two points. A *curve* is a line constantly changing its direction at every point.

95. *Parallels* are lines equidistant throughout their course.

96. A *surface* has length and breadth without thickness, and may be either plane or curved.

97. A *circle* is a figure bounded by a curve line, every point of which is equally distant from the centre. The line which limits a circle is the *circumference.* A straight line passing through the centre and terminating both ways at the circumference is the *diameter;* half the diameter is a *radius.*

98. All circles, without regard to their magnitude, are supposed to be divided into three hundred and sixty equal parts, called *degrees;* consequently, the smaller the circle the less is a degree of it. A degree of whatever magnitude is subdivided into sixty minutes, and a minute into sixty seconds. The minutes of a *great circle* of the earth are also called *geographical miles.*

99. An *arc* is any portion of the circumference of a circle. A straight line uniting the extremities of an arc is called a *chord.*

100. An *angle* is the space contained between two straight lines diverging from the same point.

---

93. The earth. How considered in mathematical geography? — 94. Of lines. Straight line. Curved line. — 95. Parallels. — 96. Surface. — 97. A circle. Circumference. Diameter. Radius. — 98. Division of the circle. Geographic miles. — 99. An arc. Chord. — 100. An angle. — 101. Measurement of angles.

101. The *magnitude* or size of an angle is measured in degrees on the arc comprehended between the lines that form the angle.

102. A *right angle* has an arc of 90°. An *acute* angle is less than a right angle; an *obtuse* angle is greater.

103. A leaden ball suspended by a line from any point above the earth's surface will tend towards the centre of the earth. Such a line is *vertical*, or perpendicular.

104. A line forming a right angle with a perpendicular is a *horizontal* line.

105. A *triangle* is a figure having three angles and three sides.

106. A *sphere* is a figure bounded by a curved surface, every point of which is equally distant from the centre of the sphere. A *hemisphere* is half a sphere. The *axis* of a sphere is the line on which it revolves; the extremities of the axis are called its *poles*.

PROBLEMS.

107. *a.* Two villages are connected by two different roads, one of which passes round a hill, the other through a thick woodland. Both villages may be seen from any point on the woodland road, which is not the case on the hill road. Which is the shortest road, and why?

b. A carpenter planed off the surface of a white pine board. What remained after the operation?

c. A Boston expressman took the cars on Monday for Providence, from thence he went to Worcester, and on Tuesday he came directly home. What geometrical figure did he describe in his route?

d. The walls of a brick building are erected perpendicularly by the "plumb line," in order to secure stability. Are the opposite side or end walls therefore parallel? Give a reason with your answer.

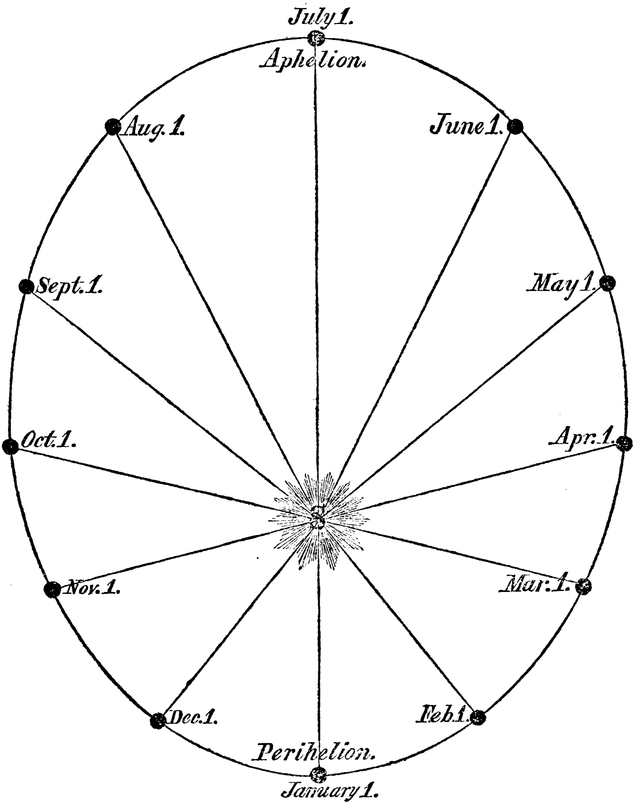
108. If we observe the *stars* above us, we may notice that most of them are fixed in their places; that they all appear to move together from east to west, so that when we have become familiar with any group of stars we can always recognize it by its uniform appearance.

109. But if we closely observe some few of the most brilliant stars, from time to time, we shall perceive that they

---

— 102. Right angle. Acute angle. Obtuse angle. — 103. A vertical or perpendicular line. — 104. A horizontal line. — 105. A triangle. — 106. A sphere. Hemisphere. Axis. Poles. — 108. Appearance of the stars. — 109. Exception move onward in nearly the same track which the sun appears to pursue. These moving stars are called *planets.* Their motions have been ascertained by astronomers to be regular, each in its own orbit revolving round the sun, from which they all derive their light and heat.

110. Now, the earth on which we live is one of the planets; it revolves about the sun as its centre, occupying nearly 365¼ days in completing one revolution. This is its yearly or annual motion, causing the changes of the seasons.



111. The pathway of the earth round the sun is called its *orbit.* It is not a circle, but is an ellipse, (oval,) the sun

---

noticed. Planets. Their motion. — 110. Motion of the earth. Time of revolution. Effects. — 111. The earth's orbit. — 112. Ecliptic. — 113. Circumferbeing in one of the *foci;* hence the earth is nearer the sun in one part of the year than in another.

112. The earth's orbit is also called the *ecliptic,* as eclipses can only occur when the earth, moon, and sun are in line with the plane of the ecliptic and with one another.

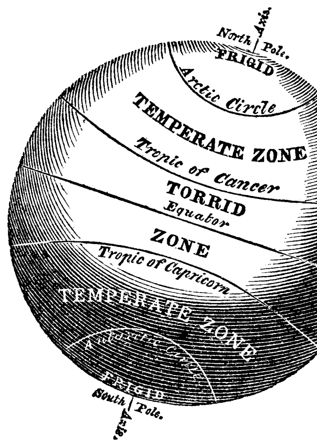
113. The earth itself is nearly 25,000 miles in circumference, and a little more than 8,000 miles in diameter. The diameter, measured in one direction, is 26 miles shorter than when measured in a transverse direction.

114. Owing to this difference in diameter, the earth cannot be a sphere, (106,) but, in geometrical language, it is an oblate spheroid. And, as a body on receiving a twirling motion will always revolve on its shortest diameter as its axis, so the earth, in obedience to this law, revolves on its shortest diameter, which circumstance determines the position of its poles.

115. While the earth, therefore, is moving forward in its orbit round the sun, it is likewise turning on its own axis from west to east once during twenty-four hours. This is the diurnal motion, and causes the alternations of day and night.

116. The axis of the earth is an imaginary straight line coinciding with its shortest diameter. It is inclined to the plane of its orbit at an angle of 66° 32′, and always remains parallel to itself.*

117. The best representation of the earth as a whole is an artificial terrestrial globe, which displays on its surface the contours and reliefs of all the parts of sea and land in their relative situations and distances.



118. The ends of the axis on which the globe turns represent the poles of the earth.

* This will require illustration by the teacher.

---

ence and diameter of the earth. — 114. True figure of the earth. Axis of motion. — 115. Diurnal motion of the earth. — 116. The axis of the earth. Its position with regard to the plane of the earth's orbit. — 117. Relief globes. — 118. Poles of the earth. — 119. The dip, or depression of the horizon. — 120.

119. As a consequence of the globular form of the earth, the *dip*, or depression of the horizon, is six feet for every three miles of distance. Hence an object six feet in height would be hidden from view by the curvature of the earth if placed at a distance of three miles.

120. The direction or bearing of one place from another, on land or sea, is usually determined by an instrument called a compass. It consists of a steel needle to which the magnetic property has been communicated.

121. Such a needle, when balanced on a pivot, will always assume a certain position — one of its extremities pointing towards that part of the heavens where the North Star is situated, and thence called the North Pole, the other extremity pointing in the opposite direction, which is the South. The direction from the right of the needle (when you face north) is the East, where the sun rises; that to the left is West.

122. Various circles and lines are drawn on the surface of a terrestrial globe, which are used for measuring distances, &c. Those circles whose planes divide the globe into two equal parts, or hemispheres, are called *great circles*, and those which divide it unequally are *less circles.* By following the arc of a great circle between any two points, the navigator pursues the shortest line connecting them.

123. A great circle passing through the poles, and dividing the globe into eastern and western hemispheres, is a *meridional circle.* Each meridional circle comprises two meridians, one being the opposite or correspondent of the other, the poles being their common points of union.

124. When the sun is on the meridian of a place it is noon, or midday, at that place, and at all places on the same meridian, and midnight to all places on the opposite meridian.

125. The Equator is a great circle passing round the globe from east to west, equidistant from the poles: it therefore intersects every meridian at right angles.

126. Owing to the inclination of the earth's axis to the plane of its orbit, certain portions of its surface are brought successively under the vertical rays of the sun, the limits of which are determined by the angle which the plane of the equator makes with the plane of the orbit, viz., 23° 28′ north and south of the equator.

The compass. — 121. Peculiar property of the compass. Cardinal points. — 122. Of the circles and lines on a globe. Great circles. Less circles. Shortest distance between two points on a globe, or the earth. — 123. Meridional circles. Meridians. — 124. Noon. Midnight. — 125. The equator. — 126. A con-

127. The northern and southern limits are called the *tropics*, or turning points of the sun; they are also termed the *solstitial* points, because the sun seems to be for a short time stationary with regard to the equator. These points mark the summer solstice, when we have the longest days in the northern hemisphere, which is about the 21st of June; and the winter solstice, when we have the longest nights, about the 21st of December. The points where the equator makes the angle with the ecliptic are called the *equinoxes*, when the days and nights are of equal length — about the 21st of March and 21st of September. In any intermediate station between the poles and the equator, these apparent motions of the sun are viewed obliquely, which renders it more difficult for young persons to understand them. Hence it seems important that they should first get a clear understanding of the motions as they appear at the equator. If we had occasion to spend a year in the city of Quito, for instance, we should see that, towards the end of March, the sun would rise due east of us, and, passing directly over our heads, set due west; that he would then appear to move northward a little every day, that is, rising a little farther north of the *east* point, and setting a little farther north of the *west* point, every day passing, not directly over our heads, but a little north of the zenith. He would thus proceed northward till he had reached about 23½° of the arch of the horizon, which would be a little beyond the middle of June, when he would appear to stop, (hence the term *solstice*;) and soon afterwards he would begin to turn (hence the term *tropic*) towards the south, till, in the latter part of September, he would again pass directly over our heads. He would then appear gradually to rise and set farther and farther to the south, till, in December, he would have reached 23½° on the horizon south of the equator in rising and setting, and at noon he would appear 23½° of the arch of the heavens farther south than the point immediately over our heads; and then stopping and turning as before, he would come again in March to rise due east of us, to pass right over our heads, and to set due west of us.

128. Latitude is distance north or south from the equator, and is reckoned in degrees, on a meridian, towards the poles; hence the highest latitude is that of 90°, or one-fourth of the earth's circumference. The mean length of a

---

sequence of the inclination of the axis to the plane of the orbit. — 127. Of tropics. Solstices. Equinoxes. — 128. Latitudes. Highest latitude. Common miles in a degree of latitude. A degree of any *great* circle.— 129. Longitude.

degree of latitude in English miles is 69.05 miles. A degree of any great circle of the earth is commonly reckoned as equal to 69¼ miles.

129. LONGITUDE is distance on the globe east or west from any given meridian, and is measured on the equator, or on any parallel of latitude. The degrees of longitude, therefore, diminish in length as the parallel circles diminish in circumference, receding from the equator.* The Americans and English consider the meridian of Greenwich, England, as the prime meridian.

130. There are twelve meridional circles drawn on an artificial globe, one through every 15° of longitude, dividing the surface into twenty-four equal parts, corresponding to the twenty-four hours of the day. Hence the revolution of the earth on its axis causes any and every point on its surface (except the poles) to move eastward through 15° in one hour of time, or 1° in four minutes. Hence, also, it is midday, i. e., twelve o'clock, noon, to all places on the same meridian; consequently to all places 15° east of that meridian the time is one o'clock, P. M., and to all places 15° west it is eleven o'clock, A. M. With these elements for calculation, we may ascertain the difference of time between points of different longitude.

131. As has been before observed, the sun's rays fall vertically, during some part of the year, upon that portion of the earth's surface which extends 23° 28′ north and south of the equator; hence at these points two circles are drawn parallel to the equator: the northern one is the Tropic of Cancer; the southern is the Tropic of Capricorn.

132. The belt of the earth's surface included between the tropics is the Torrid Zone, 46° 56′ wide. Here we find the hottest climate. The seasons are a wet winter and a dry summer.

133. When the sun is in either tropic its rays fall 23° 28′ beyond the nearest pole; hence two other circles are drawn parallel to the tropical circles, at a distance of 66° 32′ from the equator. The northern one is called the *Arctic Circle*,

* To find the number of miles to a degree in any parallel of latitude, measure in degrees of the equator the distance between two meridians in the given latitude, and multiply the number of degrees thus found by 4; the product will be *geographical miles*, which may be reduced to *common miles* by multiplying by 1.158.

Variation of length in degrees of longitude. Prime meridian. — 130. Division of the globe by meridian circles. Calculations of time.— 131. Circles at 23° 28′ north and south of the equator. — 132. The torrid zone. Seasons. — 133. Effect when the sun is in either tropic; circles at 66° 32′ north and (from *arctos*, a bear, the principal constellation of the north;) the southern one is the *Antarctic Circle.*

134. The regions beyond the polar circles, and circumscribed by them, are the Frigid Zones, each 46° 56′ in diameter, the pole forming the centre. The temperature is so cold that there is scarcely any vegetation. Snow and ice cover the land and sea nearly the whole year. The seasons are, consequently, a long, cold winter, and a short summer.

135. The regions lying between the tropics and polar circles are called the Temperate Zones, each 43° 04′ in breadth. The temperature near the polar circles is very cold in winter, and near the tropics it is very warm in summer, though, on the whole, the climate in these zones is the most delightful in the world. It is highly favorable to the production of the most useful vegetables and animals, and most conducive to the progress and well being of man. Here we have the four seasons — spring, summer, autumn, and winter.

136. At the equator the days and nights are of equal length; but as the latitude increases their relative length differs more and more, till at each pole, alternately, there is constant sunlight for six months, followed by a night of the same duration.

PROBLEMS.

137. *a.* The equator and a meridional circle are both called great circles: which is the greater? Why?

b. If you could travel northward until you should arrive at the north pole of the earth, what would you expect to see there?

c. When the sun is on the meridian of the place where you reside, in what direction will your shadow fall? Why?

d. What spot on the earth's surface has neither latitude nor longitude? Why?

e. A and B start from Philadelphia. A travels due north ten degrees, and B travels due west ten degrees: which of them travels the greatest distance? Why?

f. How do you imagine the equator appears to sailors as they are crossing it in a ship?

g. If you take the steamship from Boston to Liverpool, how many meridians would you cross?

h. A person who lived in a large city observed that at

---

south of the equator. — 134. The frigid zones. Seasons. — 135. The temperate zones. Climate. Seasons. — 136. Of day and night at the equator, and towards the poles.

noon of the longest day of the year he had no shadow, but that on every other day his noonday shadow fell towards the north. What is the latitude of the city?

i. The person who made the above observations noticed that when it was noon where he was, his chronometer indicated that at Greenwich, England, it was just twenty-eight minutes past four o'clock in the morning. In what city was he?

j. At what times in the year will a person who lives on the equator have no noonday shadow?

k. A table in arithmetic gives 69¼ miles as equal to one degree. Now, Cape Bould, Newfoundland, is 55 degrees west of London, England, and both are in the same latitude; according to the table they are 3808 miles apart, and by measurement they are 2310 miles. How will you account for this difference?

l. If that portion of the earth called the North Frigid Zone were separated from the globe, what would be its shape?

m. Were the earth's axis perpendicular to the plane of its orbit, how would it affect the days and nights? How the seasons?

n. Calculate the time of day at San Francisco when it is noon at Boston.

o. Suppose the earth performed but one revolution on its axis, in the time it is revolving once round the sun, what would be the condition of its surface?

p. Why are 23° 28′ and 66° 32′ north and south of the equator universally adopted as the boundaries of the zones?

q. An Anecdote. — Two sailors left a certain port on the same day, but in different vessels. Some time afterwards they returned, as it happened, on the same day. On meeting, Jack wished Dick a "Merry Christmas." "You are too fast," replied Dick; "Christmas does not come till day after to-morrow." As they could not agree, they referred the matter in dispute to a citizen of the place, who, to their surprise, told them that they were both wrong, as to-morrow would be Christmas day. This threefold difficulty was at length settled by a schoolmaster, who declared that each was right, and that the fact of their thus differing showed that each had kept a correct account of the days since their last meeting. Now, how can this discrepancy of dates be accounted for?

EXERCISES ON THE MAPS.

138. Which of the five oceans is largest?
What continents lie east of it?
What continents lie west of it?
What ocean east of America?
What regions north of the great continents?
What continents east of the Atlantic Ocean?
What ocean east of Asia and Australia?
What ocean north of the great continents?
What four continents are included in the Eastern Hemisphere?
Which way is Europe from Asia?
Which way is Africa from Europe?
Which are the three northern continents?
Which are the three southern continents?
What continent lies south-east of Asia?
In what direction is Africa from Australia?
What ocean intervenes?
What ocean south of the Antarctic circle?
What are the limits of the Indian Ocean?
What land in the south polar regions?
In what direction is the length of the Western continent?
In what the eastern?
Which of the two great continents is broadest?
Which is largest in extent of surface?
What capes at the northern and southern limits of America?
Through how many degrees of latitude does America extend? How many common miles?
In what latitude is Point Barrow? Cape Horn?
Through what zones does America extend?
What capes mark the east and west limits of America?
What is the longitude of each cape?
Through how many degrees of longitude does America extend?
How do North and South America lie with respect to the 80th meridian of west longitude?
How with respect to the 10th parallel of north latitude?
Which is the most northern cape of Asia?
Which the most southern cape of Africa?
Through how many degrees of latitude does the Eastern continent extend? How many common miles?
In what latitude is Cape Sĕv′ero? Cape Agŭl′has?
Through what zones does the eastern continent extend?
What capes mark the east and west limits of the Eastern continent?
In what longitude is each?
Through how many degrees of longitude does the Eastern continent extend?
Which of the great continents is longest, and by how many miles?
What portion of the Eastern continent constitutes the main body?
What is connected with Asia on the west?
What on the south-west?

What is the natural boundary between Asia and Europe?
How is Africa joined to Asia?
What does the Western continent comprise?
Which of these is the main body?
How are North and Central America united?
How are Central and South America united?
Name the chief islands in the Arctic regions.
What islands along the east coast of North America?
What islands between North and South America?
What islands at the southern extreme of South America?
What islands west of Patagonia and Chi′le?
What islands along the west coast of North America?
What chain of islands between the peninsulas of Aliäs′ka and Kamtchăt′ka?
What islands along the east coast of Asia?
Name the principal islands between Asia and Australia.
What large islands south and south-east of Australia?
What island south-east of Hindostän′?
What islands east of Africa?
What groups of islands west and north-west of Africa?
What islands west of Europe?
What islands in the Mediterranean Sea?
What islands in the Bâl′tic?
What islands north of Europe and Asia?
Principal groups in the North Pacific Ocean?
Principal groups in the South Pacific Ocean?
Where are the South Shetland Isles? Kergue′lan's Island?
What peninsulas on the east of America?
What on the west of America?
What peninsulas on the east of Asia?
What on the south and south-east of Asia?
What on the south of Europe? West and north-west?
Where is the Isthmus of Sū′ez? Of Kraw?
Where is the Isthmus of Panamä′? Of Tehuän′tepec?
Mention the name and situation of the chief capes of Europe on the north? West? South?
What capes on the north of Asia? East? South?
What capes on the north of Africa? East? South? West?
What capes on the north of North America? East? West?
What capes on the coast of Central America?
What capes on the north of South America? East? South? West?
Mention the capes of Australia.
What three systems of mountains in North America?
What three systems in South America?
What mountain chains in Europe?
What mountain chains in Asia?
What mountain chains in Africa?
What large rivers of North America flow into the Arctic Ocean? The Atlantic? The Gulf of Mexico? The Pacific?
What large rivers in South America?
Which are the chief rivers of Europe?

Which are the chief rivers of Africa?

What three large rivers in the north of Asia?

What three flow east into the Pacific?

What four flow into the Indian Ocean?

Name the chief seas, gulfs, and bays in North America. In South America.

Name the seas, gulfs, and bays of Europe.

Name the seas of Asia.

Name the gulfs and bays of Asia.

Name the seas, gulfs, and bays of Africa.

Give the name and place of the principal lakes of North America. Of South America. The lakes of Europe. Of Asia. Of Africa.

What waters are connected and lands separated by Davis's Straits? By Smith's Sound? By Lancaster's Sound? By Barrow's Straits? By Wellington Channel? By Fox Channel? By Hudson's Straits? By the Straits of Bĕlle Isle? By Florida Pass? By the Yucatăn′ Pass? By the Windward Passage? By the Straits of Juän de Fuca? By Bēhr′ing's Straits? By the Straits of Magël′lan? Where is Pū′get's Sound.

What waters are connected and lands separated by the Straits of Gibrâl′tar? By the Straits of Bonifăcio? By the Straits of Messî′na? By the Straits of Oträn′to? By the Dardanĕlles′? By the Bŏs′porus? By the Straits of Yenikä′le? By the Skăg′er Răck and Căt′tegat Channels? By the English Channel and Straits of Dover? By the Bristol Channel? By St. George's Channel?

What waters are connected and lands separated by the Straits of Bā′bel-măn′deb? By the Straits of Or′mus? By Pâlk's Straits? By the Straits of Malăc′ca? By the Straits of Sŭn′da? By the Straits of Macăs′sar? By Formō′sa Straits? By the Straits of Corē′a? By the Straits of Săn′gar? By the Channel of Tartary? By Torres' Straits? By Bäss Straits? By the Channel of Mozambîque′?

CHAPTER VI.

SPECIAL GEOGRAPHY OF NORTH AMERICA.

REPARATORY EXERCISES ON THE MAP OF NORTH AMERICA.

139. WHAT is the shape of this continent?
What cape forms its eastern angle?
What cape at the north-west angle?
Find the latitude and longitude of Tehuän'tepec.
What branches of the Atlantic Ocean indent the eastern coast?
What passage leads into each branch?
What branches has Băf'fin's Bay?
What branches has Hŭd'son's Bay?
Where is the Gulf of St. Lawrence?
What branches has the Gulf of Mexico?
What branches of the Pacific indent the western coast?
How are the Pacific and Arctic Oceans united?
What branches of the Arctic Ocean indent the northern coast?
Name the chief islands along the eastern coast.
Name those on the Pacific coast.
What peninsula extends south-west from Russian America?
What large island north of Hudson's Bay?
How is the peninsula of Labradōr' situated?
Where is Cape Charles? [C. St. Lewis.]
What peninsula lies south-west from Labradōr'?
By what waters is it bounded?
What is its southern cape?
What peninsula projects south between the Atlantic and Gulf of Mexico?
By what cape is it terminated?
Where is the peninsula of Yucatăn'?
What cape north of Yucatăn'?
What peninsula on the south-west of North America?
What is its direction from the main land?
By what cape does it terminate?
Where is the peninsula of Aliăs'ka?
Which is the most northern cape of North America?
Where is Cape Băth'urst?
What cape east of Central America?
Where is Cape Farewell?
What cape of Labradōr' west of Cape Farewell?
Name the principal capes on the Atlantic coast.

Name those on the Pacific coast.

What group of islands six hundred miles east of South Carolina?

What are the three groups of the West Indies?

What do the Greater Antîlles′ comprise?

How are the Bahā′mas situated?

How are the Lesser Antîlles′ situated?

What capes east and west of Cuba?

Name the political divisions of North America.

What country is crossed by the tropic of Cancer?

What by the Arctic circle?

What isthmus unites North and Central America?

What isthmus unites Central and South America?

What body of water is enclosed between the Greater and Lesser Antîlles′ and the main land?

What lands enclose the Gulf of Mexico?

What are the boundaries of the United States?

What country between the isthmuses of Tehuän′tepec and Panamä′?

On what parallel of latitude is North America widest?

On what meridian is North America longest?

Between what points can the longest straight line be drawn on the land?

What parallel crosses New′foundlănd′ and Vancôu′ver Islands?

Where is Cape Prince of Wales?

What place is in 16° north latitude and 95° west longitude?

What large island north of Hudson's Strait?

Of what is Hŭd′son's Bay a branch?

Of what is Băf′fin's Bay a branch?

What strait between Cumberland Island and Greenland?

Where is James's Bay?

Where is the Strait of Belle Isle?

Where are the Campēa′chy and Hondū′ras Bays?

Where are the Califŏr′nia and Tehuän′tepec Gulfs?

Where is Bēhr′ing's Strait?

Where is Coronā′tion Gulf?

Where are Sĭt′ka, Prince of Wales, and Queen Chär′lotte Islands?

Where is Southampton Island?

What large peninsula forms the most eastern portion of North America?

Where is Nō′va Scō′tia?

What islands next north and north-east of Nō′va Scō′tia?

What bay between New Brŭns′wick and Nō′va Scō′tia?

Where are the Sable Capes?

Where and what is Flŏr′ida?

What peninsula projects north from Central America?

Where is Cape Catō′che?

Where and what is Lower California?

Where is Cape St. Lū′cas?

Where is Point Băr′row?

Name the chief islands of the Arctic regions.

Where is the Gulf of Bôô′thia?

What capes between the mouth of the Mackĕn zie River and Coronā′tion Gulf?

Where is Cape Grä′cias a Dĭ′os?
What cape south of Greenland?
Where is Cape Chŭd′leigh?
Where is Cape Mendocĭ′no?
Where are Capes Cod and Hât′teras?
Where is the Bay of Săn Francĭs′co?
Where are the Bermu′das Islands?
Where is Cape Săn Antō′nio?
What circle crosses Mexico?
What circle crosses Russian and British America?
What does the Isthmus of Tehuăn′tepec connect?
What the Isthmus of Panamä′?
Where is the Caribbē′an Sea?
What island between the Caribbē′an Sea and Gulf of Mexico?
What large islands are crossed by the 49th parallel?
Of what countries is this parallel the boundary line for about 30°?
In what zones does North America lie?
What part of Europe corresponds in latitude with the New England States?
What part of Europe corresponds in latitude with the British Provinces?
What part of Africa corresponds with Florida?

§ 1. Extent and General Features of North America.

140. North America comprises a vast extent of territory, situated in the northern hemisphere. The Arctic Ocean is on its northern border, the Atlantic on the east, and the Pacific on the west and south. It approaches within forty-eight miles of Asia on the north-west, from which it is separated by Bēhr′ing's Straits.

141. It lies between the parallels of 16° and 72° north latitude, and the meridians of 56° and 168° west longitude. Its surface is estimated at about 8,000,000 square miles, and its coast line at 24,000 miles, or one mile of coast to every 345 square miles of surface.

142. The continent comprises the countries of Rŭssian America, British America, United States, and Mexico. Greenland is a detached portion lying to the north-east, and

---

140. The limits of North America. — 141. Extremes of latitude and longitude. Area. Coast line. — 142. Countries of North America. — 143. Indenta-

separated from the main by Davis's Straits and Baffin's Bay. On the south-east of Mexico are the states of Central America.

143. North America is deeply indented by several large branches of the ocean. In the north-east are Baffin's and Hudson's Bays; in the east the Gulf of St. Lawrence, and several bays along the coast of the United States; in the south the Gulf of Mexico; and in the west the Gulf of California and Bay of San Francĭs'co. The surface of the continent is diversified with highlands, plateaus, and plains, and with noble lakes and rivers.

§ 2. MOUNTAIN SYSTEMS OF NORTH AMERICA.

144. Three systems of mountains belong to this continent — the Chippewāy'an or Rocky Mountains; the Californian Coast Range; and the Appalăch'ian or Alleghā'ny Mountains.

145. THE ROCKY MOUNTAIN SYSTEM, so called from its broken and rugged character, and bare granite summits, is regarded as a continuation of the South American Andes. It commences at the Isthmus of Tehuän'tepec, and running northward, divides into three distinct ridges, at about the 21st parallel.

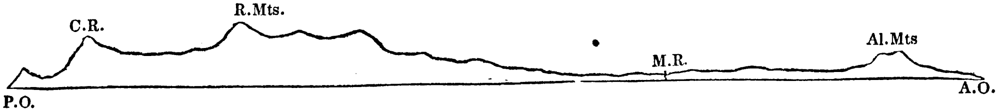
146. The eastern ridge is the Cordillê'ra de Coahuî'la. It runs parallel with the gulf coast, and terminates at the Rî'o Grän'de. The western ridge is the Cordillê'ra de Sonō'ra. It takes a north-westerly course, and becoming gradually lower as it approaches the Gulf of California, terminates in the state of Sonō'ra. The third or central ridge is the Siĕr'ra Mä'dre. It extends northward nearly to the thirty-second parallel between the head waters of the Rî'o Grän'de and Rî'o Gîl'a. This portion of the Chippewāy'ans is commonly called the Mexican Cordillê'ras.

147. The highest summits of the Mexican Cordillê'ras are in the southern portion. They are the five volcanoes extending in a line from the Gulf of Mexico to the Pacific, viz., the Tu̍xt'la, the Orizä'ba, 17,374 feet, the Popocatapê'tl, 17,717 feet, the Iztaccihuä'tl, 15,705 feet, and the Tolu̍'ca 15,542 feet.

---

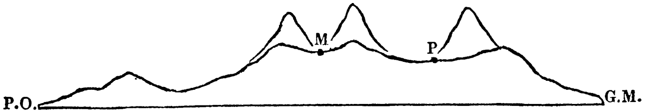
tions of the coast. Diversities of surface. — 144. Three mountain systems. — 145. Rocky Mountains. — 146. The Eastern Ridge. Western Ridge. Central Ridge. — 147. Highest parts of the Mexican Cordilleras. The five

NORTH AMERICA.



Section of North America, on the 40th Parallel.

P. O. — Pacific Ocean.
C. R. — California Range.
R. Mts. — Rocky Mountains.
M. R. — Mississippi River.
Al. Mts. — Alleghany Mountains.
A. O. — Atlantic Ocean.



Section of Mexico, about the 19th Parallel.

P. O. — Pacific Ocean.
M. — City of Mexico.
P. — Puebla City.
G. M. — Gulf of Mexico.

148. At the termination of the Siĕr′ra Mä′dre there is a gap of eighty to a hundred miles in width, on a level with the plateau. At 32° 32′ north latitude the Rocky Mountains again commence, suddenly rising out of the plane, and, extending north for about 1800 miles, terminate west of the Makenzie River, skirting the Polar Sea nearly to Point Bēēchy.

149. The Rocky Mountains, in their northern portion, are divided into several parallel ridges; and in one part no less than thirteen successive ridges are said to occur. But they run chiefly in two parallel chains, sometimes united by a transverse ridge. In some parts the eastern chain rises above the snow line;* but the general elevation is only above the line of trees. The western chain is lower till north of the 55th parallel, where both are of equal height. The culminating point of the Rocky Mountains is supposed to be in about 42° north latitude, which is the mountain knot of Frĕm′ont.

150. In Texas a branch called the Sä′ba or Ozärk′ Mountains passes off north-east to the confluence of the Missôu′ri and Mississip′pi Rivers. Many of the summits of the Rocky Mountains attain to a considerable elevation, varying from 12,000 to nearly 16,000 feet. The principal are Mount Brown, 15,900 feet; Mount Hooker, 15,700 feet; Frĕm′ont's, 13,570 feet; Long's, Pike's, and Spanish Peaks.

151. Of the depressions of the Rocky Mountain range, called Passes, there are several. That of El Pä′so, near latitude 32° north, is about 5000 feet above the level of the sea; the San′gre de Chrîs′to Pass, 8800 feet elevation; the South Pass, 7490 feet; and Lewis and Clarke's Pass, near the head sources of the Missôuri, 6000 feet elevation. In the British Possessions, at about 52° 30′ north latitude, is the Athabăs′ca Portage, of 7300 feet elevation.

152. THE CALIFORNIAN COAST RANGE OF MOUNTAINS extends from the southern extremity of the Peninsula of California to Mount St. Elias in Rŭssian America, with no other gaps than that of the "Golden Gate," and those where the Columbia and Frā′zer's Rivers find a passage.

---

* In all latitudes there is a certain height, or limit, in the atmosphere, where the thermometer never rises above 32°, and, consequently, where ice and snow remain permanently. This limit is variously called the "snow line," or "line of perpetual snow," or "line of constant congelation." It is highest in the torrid zone, where the heat is greatest.

---

volcanoes. — 148. Termination of the Sierra Madre, and continuation of the Rocky Mountains. — 149. Parallel chains. Note. Snow line. — 150. The Saba or Ozark Mountains. Remarkable summits in the Rocky Mountains. — 151. Passes of the Rocky Mountains. — 152. The California or maritime range. —

153. Although the average height of this system is less than that of the Rocky Mountains, some of its peaks are higher. The chief summits are Mount St. Elias, 17,860 feet, the highest in North America; and Mounts Fairweather, 14,925 feet, St. Hĕl′en's, Hood, Jefferson, and Shäs′ta.

154. That part of the range which traverses the State of California, at a distance of about 150 miles from the ocean, is called the Siĕr′ra Nevä′da, and is from 6000 to 7000 feet elevation. It divides the country into two parts, and exercises a decided influence on the climate and productions of each.

155. The valley of the San Joaquîn′ and Sacramĕn′to Rivers lies between the Siĕr′ra Nevä′da and the coast ridge, and is the gold region of California.

156. At about 41° north latitude, a ridge running eastward unites the Siĕr′ra Nevä′da with the Rocky Mountains, forming the watershed between the Columbia and Colorä′do Rivers. It continues east of the Rocky Mountains, from Frĕm′ont's Knot, under the names of the Wĭnd River Mountains, and Black Hills, as far as the Missouri River.

157. THE ALLEGHANIAN SYSTEM extends from Alabä′ma north-easterly to the banks of the River St. Lawrence, a distance of about 1500 miles. It comprises several parallel ridges, separated by fertile valleys, and covering a breadth of 100 to 150 miles. The watershed follows the windings of the Atlantic coast.

158. The first continued ridge of this system is the Blue Ridge. It begins at 33° north latitude, and runs a north-easterly course till it reaches the Hudson River at West Point. It rises again on the east bank of the river, and passes along the western boundary of Massachusetts, under the names of the Taghkăn′ic and the Hôô′sac Mountains; thence joining the Green Mountains of Vermont, it continues onward around the sources of the Connecticut River, terminating in New Brunswick.

159. The White Mountains of New Hampshire are a sort of advanced post of the Alleghā′nian range, being detached from it, and comprising a long range of proud eminences, of which Mount Washington is the commanding peak. Through most of the year their tops are covered with snow.

160. At a distance varying from five to ten miles west of

---

153. Principal peaks of the maritime range. — 154. The Sierra Nevada. — 155. The valley of the Joaquin and Sacramento Rivers. — 156. Watershed along the 41st parallel. — 157. The system of the Alleghanies. Course of the watershed. — 158. The Blue Ridge. Its course and change of names. — 159. The White Mountains. Mount Washington. — 160. The Kittatinny range. —

the Blue Ridge is the Kittatĭn′ny ridge, extending from Alabä′ma to New York, a length of about 800 miles. Next beyond the Kittatĭn′ny is the Alleghā′ny ridge, extending only 300 miles from south-west to north-east, between the Kanâw′ha and Susquehăn′na rivers. Several subordinate ridges lie west of the Alleghā′ny, of which the Cumberland mountains in Kentucky and Tennessee′, and the Laurel and Chestnut Ridges in Pennsylvania, are the most considerable.

161. The ridges of the Alleghā′nian system are not generally elevated more than 2500 feet above the level of the sea. The lowest point appears to be in the valleys of the Delaware and Hudson, where they do not exceed 1000 feet. They rise towards their extremities, and in the White Mountains at the north we find the summit of Mount Washington to be 6226 feet, and in the south the Black Mountain, in North Carolina, 6476 feet in height.

§ 3. PLATEAUS OF NORTH AMERICA.

162. The great table lands of Mexico begin at the Isthmus of Tehuän′tepec, and extend north-westerly to 40° north latitude, a distance of 1600 miles. They lie between the ridges of the Mexican Cordillê′ras, expanding towards the north-west with their divergence, till, at the parallel of 20°, they attain their greatest breadth and height. From an elevation of 5000 feet on the east, they rise towards the west to the height of 7480 feet, and then descend to 4000 feet towards the Pacific.

163. The descent from these plateaus to the lowlands is very steep on all sides. Only two good roads from the Gulf of Mexico lead to the plateau — one at Xalä′pa, (Ha-la′pa,) near Vê′ra Crûz, the other at Saltîl′lo, (Sal-teel′yo,) near Monterêy′. Where the surface is not traversed by mountains, the plateau is nearly level. A fine road extends for 1200 miles from the city of Mexico to Sän′ta Fê.

164. In the southern part, the plateau is divided into four distinct plains, surrounded by hills. In the plain of Tenochtĭt′lan stands the city of Mexico, 7480 feet above the level of the sea.

165. In these table lands there are deep cavities or rents,

The Alleghany ridge. Other subordinate ridges. — 161. Elevation of the Alleghanies. Lowest point. Highest points. — 162. Describe the Mexican plateaus. Their elevation from east to west. — 163. Their declivities. Roads. — 164. Plains in the south. City of Mexico. — 165. Barancas. —

called Barän′cas, two or three miles wide, and many more in length, with a depth often of 1000 feet, and a stream of water flowing through them.

166. The Alleghā′nian Plateau lies between the Blue and Alleghā′ny ridges, extending more than 800 miles from Alabä′ma to New York. Its highest elevation is at the south, being about 2000 feet, and descending northward to 500 feet.

§ 4. DECLIVITIES AND PLAINS OF NORTH AMERICA.

167. The relative position of the Alleghā′nian and Rocky Mountains naturally divides the surface of the continent into three sections.

168. The section east of the Alleghā′nies forms the ATLANTIC DECLIVITY, reaching from the eastern coast of Massachusetts to the Gulf of Mexico. In the New England States this tract is very narrow, comprising the mere coast and islands; it expands in its course southward, the mountains in South Carolina being over two hundred miles from the sea. From the Blue Ridge to the sea coast it is divided into two distinct portions — the Atlantic terrace, or middle country, and the măr′itime lowlands.

169. The line of separation between the terrace and lowlands may be traced from the Hudson River nearly to the Mississippi, by a rocky ledge rising above the low, flat, sandy plain, which extends from their base to the Atlantic. This dividing ledge is marked out by the rapids and cataracts observed in ascending the rivers.

170. A line traced from New York city, through Trenton, Baltimore, Washington, Fredericksburg, Richmond, Fayetteville, Columbia, Augusta, and Milledgeville, will also mark this boundary, as each of these cities is situated on a river at or near the rapids or falls, at the head of tide water.

171. The terrace has an elevation of from 50 to 300 feet, and extends westward to the foot of the mountains. It is continued around the southern extremity of the Alleghā′nies, between the uplands and lowlands of the Gulf of Mexico, and across Texas to the foot of the Mexican Cordillê′ras. This fine tract includes some very rich and fertile valleys.

---

166. The Alleghanian plateau. — 167. Sections of the continent. — 168. The Atlantic declivity. Atlantic terrace and maritime lowlands. — 169. Line of separation between the terrace and lowlands. — 170. Cities along this line. — 171. Elevation and width of the terrace. Its continuation southward. —

172. The Pacific Declivity is divided into three portions —the lowlands, extending from the ocean to the coast range; the middle country, or first terrace, lying between the coast range and the Siĕr′ra Nevä′da and Blue Mountains; and the upper country, or second terrace, extending from the Siĕr′ra Nevä′da and Blue Mountains to the crest of the Rocky Mountains.

173. The Great Central Plain of North America lies between the Rocky and Alleghā′nian Mountains, and extends from the Gulf of Mexico on the south to the Arctic Ocean on the north. A low table land, about the 47th parallel, in Minnesō′ta, forms the watershed between the waters that flow north and north-east into the Arctic and Atlantic Oceans, and those that flow south into the Gulf of Mexico. The height of this watershed is from 1600 to 2000 feet above the level of the Gulf of Mexico. Within the great central plain are included the basins of the Mississippi, the St. Lawrence, and the northern declivity.

174. The basin of the Mississippi presents a uniform character, rising by a gentle ascent from the gulf to the sources of the Mississippi River, and also from the west bank of the river to the foot of the Rocky Mountains. On the east bank towards the Alleghā′nian Mountains, it is more broken and uneven. The eastern portion of this basin is well wooded and fertile; the middle portion is fertile, but generally bare of wood; while in the west, at the foot of the Rocky Mountains, we find the Great American Desert.

175. A belt of forest land, known as the "Cross Timber," extends in a direct line from north to south across the prairies of Northern Texas and the Ozärk′ country to the Arkăn′sas River. It varies in width from five to fifty miles, and in some parts is so straight and regular that it looks like a work of art, and when viewed from the adjoining prairies on the east or west has the appearance of an immense wall of woods.

176. The basin of the St. Lawrence is a narrow tract, bounded on both sides by ranges of highlands which separate its waters from those of the surrounding declivities. The average fall of the basin from south-west to north-east is little more than six inches in a mile; but it is very unequally distributed, on account of many cataracts, rapids, &c., along its course. The greater part of the northern declivity, lying

---

172. The Pacific declivity.—173. Great central plain of North America. Watershed of this plain. Its summit level. Basins of the plain.—174. Describe the basin of the Mississippi. The eastern, middle, and western portions.—175. The "Cross Timber."—176. Basin of the St. Lawrence. Northern

north of the plateau of Minnesō′ta, is a bleak and barren waste, interspersed with many lakes, which pour their waters either into Hudson's Bay or the Arctic Ocean.

§ 5. River Systems of North America.

177. North America contains *five distinct river systems*, corresponding with the declivities and basins before described.

178. The *first* in order is a system of innumerable lakes and rivers in the northern declivity, which either flow into the Arctic Ocean through the Mackenzie, Coppermine, and Back Rivers, or into Hudson's Bay through the Nelson and Albany Rivers, besides many others.

179. The *second* is the River St. Lawrence, with its chain of lakes. This is the grand outlet of the largest fresh water system in the world. Its most western source is the River St. Louis, an affluent of Lake Superior, rising in the table land of Minnesō′ta, at an elevation of about 1200 feet above the sea level.

180. The short rivers or straits which serve to connect the great lakes one with another take special names, but the great river is first known as the St. Lawrence, as it issues from Lake Ontā′rio. Continuing a north-easterly course, it flows into the Gulf of St. Lawrence. Its entire length is about 2000 miles.

181. The *third* is the Mississippi, which is the great central river of North America. It rises in the small lake Ităs′ka, in 47° N. lat., 94° W. lon., at an elevation of 1680 feet above the level of the Gulf of Mexico, and after a southerly course of 3160 miles, receiving many tributaries in its progress, it empties into the Gulf of Mexico.

182. The Mississippi, in connection with its main affluent, the Missouri, is the dividing line between two great planes, one descending from the summit of the Alleghā′nies, the other from the summit of the Rocky Mountains. The uniform and gradual descent of different portions of this great river is very remarkable. From the Gulf of Mexico to the Grand Falls of the Missouri, a distance of 4000 miles, there is no obstacle to the running of light-draught steamboats at

---

declivity. — 177. River systems of North America. — 178. Waters of the northern declivity. — 179. The River St. Lawrence. Source. — 180. The name. Course. Termination and length. — 181. The Mississippi River. — 182. The Mississippi and Missouri a dividing line. Descent of the different portions of the Mississippi. Elevation of the Grand Falls. Affluents from all seasons of the year, when the river is free from ice. The elevation of the Grand Falls is 2300 feet above the level of the sea. The Arkăn′sas and Red Rivers are also affluents of the Mississippi from the west.

183. The rock forming the Alleghā′ny ranges being chiefly limestone, the rivers that fall from them have cut for themselves deep channels, far below the general surface of the country. They consequently have a gentle flow, with sufficient water to render them navigable for a great part of the year. The main tributary entering the Mississippi from the east is the Ohio. The descent of this river from Pittsburg to its mouth, a distance of 975 miles, is 424 feet. The Ohio is formed by the confluence of the Alleghā′ny and Monongahē′la Rivers.

184. The Tennessee′ and Cumberland Rivers, which, with the Ohio, drain the greater part of the western slope of the Alleghā′nies, possess the same general characteristics as the Ohio. The slight descent of these rivers gives them gentle currents and deep channels, peculiarly favorable to commerce. Besides the Mississippi there are many other streams which flow directly into the Gulf from this basin. Of these the Rî′o Grän′de del Nör′te is the largest.

185. The streams that flow from the Atlantic declivity into the ocean constitute the *fourth* of the North American river systems. All these are short and comparatively small, but they are of the highest utility. Many of them, by falling over the rocky ledge which marks the Atlantic terrace, afford an enormous and extensive water power, and, being navigable from the ocean quite across the maritime lowlands, have determined the location of some of the chief cities of the United States.

186. The streams that flow from the Pacific declivity into the ocean constitute a *fifth* river system of this continent. The largest is the Columbia River, which has its sources not far from those of the Missôu′ri and Rî′o del Nör′te. After a winding course of 1000 miles, in which it receives many tributaries, it crosses the coast range, where it forms some grand cataracts, (hence the name Cascade Range,) and having passed between the lofty summits of Mount Hood and Mount St. Hĕl′en's, it falls into the Pacific Ocean near the

---

the west. — 183. Of the rivers from the western slope of the Alleghanies. Describe the Ohio. — 184. The Tennessee and Cumberland. Other rivers from the Mississippi basin. — 185. Rivers of the Atlantic declivity. Their utility. — 186. Rivers of the Pacific declivity. The Colorado and Gila Rivers. — 187.

46th parallel. The Colorä′do from the Rocky Mountains in the north-east of Ū′tah, and the Gî′la from the south of New Mexico, flow into the head of the Gulf of California.

187. The watershed of the Rocky Mountains being at a greater distance from the Pacific than that of the Alleghā′nies from the Atlantic, the rivers are longer, but not so numerous. The Sacramĕn′to and San Joaquîn′ Rivers, though comparatively small streams, have become celebrated from the extensive and rich gold region through which they flow. In Russian America, west of the Rocky Mountains, the land slopes towards the Arctic Ocean, and is drained by the Cŏl′ville and its tributaries.

§ 6. Lakes of North America.

188. The higher latitudes of both the old world and the new are characterized by fresh water lakes; but in number and extent those of the new world far exceed those of the old. The American lakes contain more than half the quantity of fresh water on the globe. The five principal lakes, Superior, Hū′ron, Michigăn′, E′rie, and Ontā′rio, cover an ā′rea of about 94,000 square miles.

189. The height of these lakes shows the slope of the continent. The surface of Lake Superior is 598 feet above the level of the ocean. Lakes Hū′ron and Michigăn′ are 20 feet lower than Superior; Lake E′rie is 13 feet lower than Hū′ron; and Lake Ontā′rio is 333 feet lower than E′rie. Of this difference of level between E′rie and Ontā′rio 165 feet form one perpendicular fall, and 51 feet the descent of the rapids above the falls. The St. Lawrence, which drains the whole, slopes 232 feet between the foot of the falls and the sea. The bed of Lake Superior is 300 feet, and that of Ontario 268 feet, below the surface of the ocean.

190. The principal lakes in British America are Wĭn′nipeg, Deer, Wŏl′laston, Athabăs′ca, Great Slave, and Great Bear Lake. They may be regarded as the chief members of separate basins, each embracing a wide extent of country. In New York State there are many lakes which belong to

---

Comparison of the rivers of the Pacific and Atlantic declivities. The Sacramento and San Joaquin Rivers. Rivers in Russian America. — 188. Of lakes in the higher latitudes of the continents. The American lakes. Area comprised within the five great lakes. — 189. Summit level of these lakes. Descent of the St. Lawrence. Bed of Lake Superior and Lake Ontario. — 190. Principal lakes in British America. How regarded. Lakes of New York. Of New Hampshire and Maine. Lakes in the south of the Mississippi basin. —

the basin of the St. Lawrence; the largest of them is Lake Çhamplain′, 128 miles long. The lakes of New Hampshire and Maine belong to the Atlantic declivity. In the southern part of the Mississippi basin, Lakes Pontchartrāin′, Borgne, and others fall into the Gulf of Mexico.

191. In the Pacific declivity on the first terrace, in California, are the Tŭ′le Lakes; and in Ū′tah, on the second terrace, are the Greạt Salt Lake, Ū′tah Lake, and Py̆r′amid Lake, which have no outlet to the sea.

§ 7. Physical Aspects of Central America and the West Indies.

192. As a natural division Central America comprises all the territory between the Isthmuses of Tehuän′tepec and Panamä′. It extends from north-west to south-east, about 1200 miles, varying in breadth from 20 to 400 miles.

193. The line of the Pacific coast is comparatively regular, but on the northern and eastern side the coast line is very much broken. The Peninsula of Yucatän′ projects north to Cape Catō′che, having the Bay of Campē′che and Gulf of Mexico on the west and north, with the Caribbē′an Sea and Bay of Hondŭ′ras on the east. From the Bay of Hondŭ′ras the coast extends east to Cape Grä′cias a Dī′os; thence southerly to the Isthmus of Panamä′.

194. Central America is not traversed by any very distinct mountain chain, but elevated plateaus occupy its central parts, forming a kind of communication between the Rocky Mountains of North America and the Andes of South America. The highlands descend more precipitously on its western side, but to the north and east the country slopes gradually. The whole territory consists of three distinct groups, divided by valleys which run from sea to sea. They are Cōs′ta Rī′ca in the south-east, the group of Hondŭ′ras and Nicarä′gua in the middle, and Guatemä′la in the north and west.

195. In Cōs′ta Rī′ca there are table lands of more than 3000 feet height, narrow and chain-like, with the Cordillê′ra de Verä′gua, about 9000 feet, and many volcanoes. In Guatemä′la the table lands are larger, and occur in many terraces,

---

191. Lakes of the Pacific declivity. — 192. Central America as a natural division. Extent. — 193. Its coast line. Peninsula of Yucatan. The coast from the Bay of Honduras. — 194. Reliefs of Central America. Slopes. Natural divisions of the country. — 195. Of Costa Rica. Of Guatemala. — 196.

containing large savannas and magnificent forests, bordered on the coast by a series of isolated volcanoes.

196. The Volcä′no de Ä′gua, 15,000 feet high, is a perfect cone, verdant to its summit. It occasionally pours forth torrents of boiling water and stones. The old city of Guatemä′la has been twice destroyed by it. Altogether, there are thirty-nine volcanoes in Central America.

197. In the large plain of Nicarä′gua is the Lake Nicarä′gua. It is about 130 feet above the level of the Pacific, and discharges its waters by the San Juän′ River into the Caribbē′an Sea. All the large rivers of Central America flow north-east and east.

198. The West Indian Islands, which are regarded as once forming a part of the continent of America, are divided into three distinct groups — the Lesser Antîlles′, the Greater Antîlles′, and the Bahā′ma Islands. Some of the Lesser Antîlles′ are flat, but their general character is bold, with a single mountain, or group of mountains, in the centre, which slopes to the sea all around.

199. Trinidăd′ is the most southerly of a line of magnificent islands, which form a semicircle, enclosing the Caribbē′an Sea. The line is single to the Island of Guadalôupe′, where it divides into two chains. Trinidăd′, Tobä′go, St. Lū′cia, and Dominī′ca are particularly mountainous, and the mountains are cut by deep, narrow ravines, covered by ancient forests.

200. Most of the volcanic islands have conical mountains, and are in the single part of the chain. Nearly all the Lesser Antîlles′ have a large portion of excellent soil in a high state of cultivation. Most of them are surrounded by coral reefs, which render navigation dangerous. These islands terminate north with the group of the Virgin Islands.

201. The group of the Greater Antîlles′ comprises the four largest and finest of all the West Indies. Porto Rico has wooded mountains running from east to west through the centre, extensive savannas in the interior, and very rich soil on the northern coast.

202. Hayti, 340 miles long, 132 broad, has a chain of mountains in its centre, extending from east to west, like all the mountains in this group, the highest point of which is 9000 feet above the sea. A branch diverges from the main stem

---

Volcano de Agua. Number of volcanoes. — 197. Of lakes and rivers of Central America. — 198. The West Indies. How regarded. How grouped. Of the Lesser Antilles. — 199. Trinidad and other islands. — 200. Volcanic islands. — 201. The Greater Antilles. Porto Rico. — 202. Hayti. — 203. Jamaica. —

south and west to Cape Tiburōn′, so that Hāy′ti contains a great proportion of high land. The mountains are susceptible of cultivation nearly to the summit. The extensive plains are well watered, and the soil productive.

203. Jamaica belongs to the British government, and is chiefly valuable for its sugar plantations. The principal chain of the Blue Mountains lies in the centre, with offsets which cover all the eastern part of the island. The elevated ridges are flanked by lower ranges, descending to verdant savannas. Not more than a twentieth part of the island is level ground.

204. Cuba, the largest of the West Indies, is 648 miles long, and from 25 to 107 miles in breadth. Area, 31,468 square miles. Its mountains, which rise to the height of 7000 feet, occupy the centre, and fill the eastern part of the island. Though much of the low ground is swampy and unhealthy, there are rich valleys and extensive fertile plains. About a seventh part of the island is cultivated. The coast is so beset with coral reefs, sand banks, and rocks, that but a small part of it is accessible. There are, however, several excellent harbors.

205. The Bahama Islands comprise about 500, many of them mere rocks; twelve are rather large, and are cultivated. They produce logwood and mahogany.

§ 8. Geology of North America.

206. The geological structure of the highlands of this continent, particularly those of Mexico and Central America, is distinguished by some remarkable peculiarities. The Alleghanies present their scarp or steepest side to the east, where granite, gneiss, and other primitive rocks are seen. Upon these lie, first, a thin formation of transition rocks dipping to the westward; and next a series of secondary rocks, including a very extensive coal formation, which reaches from Pittsburg to far beyond the Mississippi River. The Ozark′ Mountains exhibit similar strata in the same order and position, and therefore probably consist of a western portion of the same beds raised to the surface by a slip or dislocation. In the Rocky Mountains primitive rocks are found in the centre or axis of the chain, with old red sandstone, coal, and new red sandstone, containing rock salt, leaning against its sides. A great

---

204. Cuba. — 205. Bahamas. — 206. Geology of North America. The Alle-

tract to the eastward of this chain is covered with granitic sands, and near the bed of the Mississippi there is a deep formation of alluvium. The Mexican table lands consist chiefly of transition slaty rocks, intermixed with which are two species of limestone, and enormous masses of porphyry, trachyte, sienite, basalt, and other rocks of volcanic origin. The veins of silver and gold are found chiefly in the older porphyry, the granular limestone, the sienite, and the transition slates.

207. The coal fields of the states are of prodigious extent. The ascertained areas of the coal formation are as follows: In Alabă′ma, 3400 square miles; Georgia, 150; Tennessee′, 4300; Kentucky, 13,500; Virginia, 21,195; Maryland, 550; Ohio, 11,900; Indiana, 7700; Illinois, 44,000; Pennsylvania, 15,437; Michigăn′, 5000; and Missôu′ri, 6000. The coal east of the highest Alleghā′nies generally takes the form of *ăn′thracite,* while west and in the valleys of the great central rivers it is *bitū′minous.*

TABLE OF MINERALS IN NORTH AND CENTRAL AMERICA.

GOLD. — United States, (California, Carolinas, Georgia,) Mexico, (North-western States,) and Central America.

SILVER. — United States, (in the lead districts of Lake Superior, &c.,) Mexico, (Central States,) and Central America.

ZINC, TIN, AND MERCURY. — United States, (California,) and in Mexico.

COPPER. — United States, (New Jersey, New York, and in the regions of Lake Superior, &c.,) and in Mexico.

LEAD. — United States (Illinois, Missouri, New York, &c.) and Mexico.

IRON. — United States, (Pennsylvania, New Jersey, New York, Maryland, Massachusetts, Connecticut, Carolina, &c.,) Canada, (the mines of St. Maurice, &c.,) Mexico, and Central America.

COAL. — *Anthracite:* Pennsylvania, &c. *Bituminous:* Throughout the Western States; Nova Scotia, and Cape Brĕt′on Island.

SALT. — United States, (New York, Massachusetts, Kentucky, Illinois, Missouri, and California,) Mexico, (Oaxă′ca, &c.,) and in Central America.

---

ghanies. The Ozark Mountains. The Rocky Mountains. The Mexican table lands. — 207. The coal fields. Two descriptions of coal.

§ 9. Questions for Review.

208. What general form of contôur′ has North America?

What features in the reliefs of the continent seem to have determined its outline?

What three mountain systems in North America?

Which is the most extensive?

Of what grand range is it a part?

What range runs nearly parallel to the Rocky Mountains on the western border?

What is the position of the Alleghā′nies? Their length? Their average height?

Name the principal ridges in order from east to west?

Which of these is longest? Which highest?

What outpost of the Alleghā′nies in New England?

Which are the two loftiest summits of the Alleghā′nies? The height and situation of each?

Which is the lowest portion of this system?

How far is the Blue Ridge from the Atlantic?

What is the average breadth of the Alleghā′nies?

On which side is the shortest slope?

How is the eastern slope divided?

Under what names is the Blue Ridge continued north-eastward from the Pennsylvania line?

What determines the course of the River St. Lawrence?

Trace the watershed south of the Great Lakes and the St. Lawrence.

What is the general direction of the rivers flowing from the Atlantic declivity?

Name the five river systems of this continent.

From what elevation do the head waters of the Mississippi flow?

What are the latitude and longitude of this "height of land"?

Which are the chief tributaries of the Mississippi from the Alleghā′nies?

Is their current swift or gentle? And why?

What affluents of the Mississippi flow from the Rocky Mountains?

Trace the watershed which divides the head waters of the Mackenzie River and Hudson's Bay from those of the St. Lawrence and Mississippi.

By what is the western slope of the Alleghā′nies characterized?

What marks the eastern slope of the Rocky Mountains?

What basin is formed by these two slopes?

From what mountain knot does the Rī′o del Nōr′te flow?

What river basins west of the Rocky Mountains?

What two noted gaps in the Californian coast range?

What forms the basin of the Cōl′ville River?

Which is the most extensive plateau in North America? Describe it.

What contrast is presented by the mouths of the Mississippi and Mackenzie Rivers?

How do you account for this?

Which of the mountain ranges rise above the *snow line* in the temperate zone?

What is there remarkable in the Great Salt Lake basin?

What rivers flow from the mountain knot of Frĕm′ont?

Which are the principal summits in this mountain knot?

What peaks in the Rocky Mountains north of the knot?

What volcanoes in Mexico?

Which are the prominent peaks in the Californian coast range?

Describe the highest mountain in North America.

What three branches of the Rocky Mountains run northward from the Isthmus of Tehuän′tepec?

Which is the main chain?

What branch passes off from the eastern border of the table land of Mexico?

What river basins occupy the northern declivity of North America?

What bay or inland sea does this region include?

What rivers and lakes belong to the basin of Hudson's Bay?

What rivers and lakes belong to the basin of the Mackenzie?

What lakes and rivers are comprised within the basin of the St. Lawrence?

What rivers belong to the basin of the Mississippi?

What are the chief points of difference between the eastern and western slopes of the Rocky Mountains?

Difference between the Rocky Mountains and coast range?

Where are their crests respectively below the snow line?

Where do we find the greatest body of fresh water in this continent?

By what channels do the waters from the interior reach the seas?

Into what sections is the continent divided by the Rocky Mountains and the Alleghā′nies?

Which is the most extensive of the plains?

What river basins does it include?

To what basin does Lake George, New York, belong?

Into what sections is Central America divided?

What does the position of Lake Nicarä′gua indicate with regard to the reliefs of Central America?

What appears to have determined the contour and relative position of the Greater Antilles′?

What are the comparative areas of the three great watersheds or declivities of the United States — the Atlantic, the Pacific, and the Mississippi?

How does the course of the Mississippi River affect its commerce?

Which of the cities, Quebec or Montreal′, occupies the higher ground?

How is it determined?

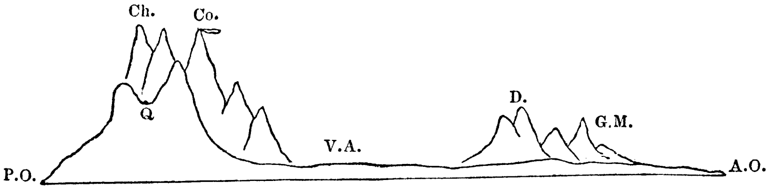
CHAPTER VII.

SPECIAL GEOGRAPHY OF SOUTH AMERICA.

Preparatory Exercises on the Map of South America.

209. How is South America bounded?
Of what form is the general outline of South America?
Which is the most northern cape? The most eastern?
Which is the most southern cape? The most western?
Between what extremes of latitude does South America extend?
Between what meridians?
In what zone is the greater part of the continent?
What bodies of water on the north?
What branches of the Caribbē′an Sea indent the coast?
What ocean on the east?
What branches of the Atlantic indent the coast?
What ocean on the west?
What indentations are formed by the Pacific?
By what strait is the continent terminated on the south?
Name the chief islands on the north.
What large island next south of the Strait of Magellan?
Where is Cape Galē′nas? Cape Pä′ria?
What cape of Brazîl′ near the tropic of Capricorn?
What capes at the mouth of the Rî′o de la Plä′ta?
Where is Cape Blän′co?
What peninsulas along the coasts of Patagō′nia?
What islands along the western coast of Patagō′nia?
Where are Fâlk′land Islands?
Where is Cape St. Rōque′?
What islands *off* the coast of Chi′le?
What island *near* the coast of Chî′le?
In what zone is the southern portion of the continent?
What political states border on the northern coast?
What states on the Atlantic?
What states on the Pacific?
What states between Buê′nos Aȳ′res, Brazîl′, and Uruguāy′?
Which states are crossed by the equator?
Which by the tropic of Capricorn?
How is the Island of Marä′jo, or Joan′nes, situated?
Where is the Gulf of Darĭĕn′?
What lake and gulf in the north-west of Venezuē′la?
Where is the Bay of All Saints?
Where is Cape Fri′o?
What important city about 159 miles west of Cape Frî′o?

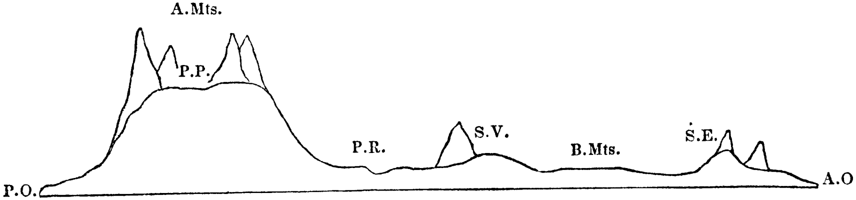
SOUTH AMERICA.



Section of South America, on the Equator

P. O.— Pacific Ocean.
Ch.—Mt. Chimborazo.
Co.— Vol. Cotopaxi.
Q.— City of Quito.

V. A.— Valley of the Amazon.
D.— Peak of Duida.
G. M.— Guiana Mountains.
A. O.— Atlantic Ocean.



Section of South America, on the 20th Parallel.

P. O.— Pacific Ocean.
A. Mts.—Andes Mountains.
P. P.—Peruvian Plateau.
P. R.— Paraguay River.

S. V.—Sierra dos Vertentes.
B. Mts.—Brazilian Mountains.
S. E.— Sierra do Espinhaço.
A. O.—Atlantic Ocean.

§ 1. EXTENT AND GENERAL FEATURES OF SOUTH AMERICA.

210. SOUTH AMERICA is one of the three southern continents, remarkable for its richness and fertility, and the majesty of its natural features. Its shape is triangular, and its coast line regular. It is bounded on the north by the Caribbē'an Sea, and is joined to Central America by the Isthmus of Panamä'. It has the Atlantic Ocean on the east, the Pacific Ocean on the west, and terminates in a point at the south.

211. South America extends from 12° N. lat. to 56° S. lat. and from 35° to 82° W. lon. It is estimated to contain about 8,200,000 square miles. Its coast line is 13,600 miles, or 1 to every 603 square miles of surface. It comprises the *national divisions* of New Grenä'da, Venezuē'la, Guiä'na, Ecuadōr', Perū', Brazîl', Bolî'via, Paraguāy', Uruguāy', Buê'nos Aȳ'res, Chî'le, and Patagō'nia.

212. The coast is but slightly indented by the ocean. In the north are the Gulf of Dariēn' and Gulf of Maracāy'bo; in the east the Bay of All Saints; in the west the Gulf of Guayaquîl' and Bay of Chō'co. The greatest expansion of land is within the tropics. The colossal range of mountains which traverse the continent of South America from north to south, and the almost boundless plains which occupy so large a portion of its eastern surface, form the two most remarkable features.

§ 2. MOUNTAIN SYSTEMS OF SOUTH AMERICA.

213. SOUTH AMERICA comprises three separate mountain systems,—the An'des, the Brazîl'ian Mountains, and the Parî'ma Mountains.

214. THE ANDES SYSTEM, which is the longest and one of the loftiest in the world, runs the whole length of the continent in a continuous line of 4180 miles, in the direction of the meridians, and from 50 to 150 miles distant from the Pacific coast. It is remarkable for the numerous active volcanoes along its whole course.

215. From its southern extremity to about the 20th degree

---

210. SOUTH AMERICA. Shape and coast line. Boundaries.—211. Extent. Area. Length of coast line. National divisions.—212. Indentations of the coast. Greatest expanse of land. Two remarkable features.—213. Three mountain systems.—214. The Andes system. General view.—215. From

of south latitude, it is merely one grand and continuous range of mountains; but north of that the chain divides into longitudinal ridges, which enclose a series of valleys or table lands, forming so many basins, enclosed at various points by transverse groups, or mountain knots, or by single ranges crossing between them. There are five principal knots, namely, the knot of Pōr′co and Potō′si, in 20° S. lat.; the knot of Cŭs′co, in 14° S. lat.; the knot of Huanū′co and Päs′co, in 10° S. lat.; the knot of Lō′ja, (Lō′ha,) in 4° S. lat. and the knot of Päs′to, in 1¼° N. lat.

216. The great chain of the Andes first commences at Cape Horn, the most southern point of the Tiĕr′ra del Fuê′go islands. Mount Darwin, 6800 feet in height, is on the principal island. This group of mountainous islands is cut off from the main land by the Strait of Magĕl′lan.

217. In Patagonia the Andes rise to 8030 feet. The Pacific washes their base, which is a high, precipitous, rocky coast, rent into chasms. Continental islands line the coast, forming an exterior mountain range, whose summits appear rising above the sea.

218. The Chilian Andes, which follow, are about 80 miles across, and toward the ocean are flanked by extensive plains from 1200 to 2000 feet elevation, from which the ridge rises with a very steep acclivity. There are several passes across this ridge: the most important is that of a great line of road between the city of Bue′nos Ay′res and Valparai′so. The Peak of Aconcä′gua, near the latter city, rises to the height of 23,910 feet, which is believed to be the highest in South America.

219. North of the knot of Pōr′co the chain divides into two ridges, and bending towards the north-west, encloses the valley of Desaguadê′ro. In the eastern ridge, or Cordillê′ra Reäl′, are the lofty summits of Sorä′ta, 21,290 feet, and Illimä′ni, 21,150 feet in height. In the western, or Cordillê′ra of the coast, there are other towering summits. In the knot of Cŭs′co the ancient city of Cŭs′co was situated. Four roads led from the city to different parts of the empire, all crossing mountain passes of more than 12,000 feet elevation.

220. At the knot of Päs′co and Huanū′co the chain of the

---

the southern point to the 20th degree south latitude. North of the 20th parallel. Principal knots. — 216. First beginning of the Andes chain. Mount Darwin. Separation of these islands from the main land. — 217. The Patagonian Andes. Continental islands. — 218. The Chilian Andes. Highest peak of the Andes. — 219. Division north of the knot of Porco. Remarkable summits. Knot of Cusco. — 220. Division in the knot of Pasco

Andes is divided into three ranges, forming the valleys of the Upper Maranōn′, the Huallä′ga, and the Ucayä′le Rivers; and from the mountain knot of Lō′ja the chain divides into two great longitudinal ridges or cordilleras, passing through Ecuadōr′ to the knot of Päs′to, in New Grenä′da. These ridges enclose a vast longitudinal valley, which is divided into three basins, of which the valley or table land of Quî′to is one of extraordinary beauty.

221. At the knot of Päs′to the Andes are again separated into three ridges: the western, or Cordillê′ra de Chō′co, which is the main chain, passes towards the Isthmus of Panamä′; the eastern, or Cordillê′ra dĕl Sŭm′ma Päz, passes north-east through New Grenä′da, along the coast of Venezuē′la to Cape Pä′ria; and the central ridge, or Cordillê′ra de Quîn′diu, runs north between the Magdalē′na and Câu′ca Rivers. The Peak of Tolî′ma is the highest of its summits, being 18,000 feet.

222. The Brazilian System of mountains embraces those chains which extend from south-west to north-east along the Atlantic coast. The Siĕr′ra do Mär, or maritime range, running from Uruguāy′ River to Cape St. Rōque′, and, parallel to this, the Siĕr′ra dō Espinhä′ço, enclose the basin of the Sän Francîs′co. *Itäm′be*, the highest of the Brazîl′ian Andes, (5960 feet,) is in the latter chain.

223. A transverse chain, Siĕr′ra dōs Verten′tes, begins south of Vîl′la Rî′ca, and, running in a tortuous line, terminates near the junction of the Bê′ni and Mamō′re Rivers. It forms the watershed of the tributaries of the Sän Francîs′co and Amazōn′ on the north, and those of the Rî′o de la Plä′ta on the south. Its greatest elevation is 5830 feet.

224. The Pari′ma System of mountains is an irregular group scattered over a table land not above 2000 feet elevation, extending from west to east, and encircled by the Orinō′co, Cassiquiä′ri, Rî′o Nê′gro, Amazōn′, and the Atlantic Ocean. This system is wholly unconnected with the Andes. Rising from the south bank of the Lower Orino′co, it ascends by four successive terraces to undulating plains.

225. The Siĕr′ra Parî′me is the principal chain, extending from the River Mê′ta across the plains of Esmerälda. This

---

and Huanuco. River valleys. Division between the knot of Loja and the knot of Pasto. Enclosed valley. — 221. Division at the knot of Pasto. Cordillera of Choco. Of Summa Paz. Of Quindiu. Peak of Tolima. — 222. Brazilian system. Parallel ranges. Peak of Itambe. — 223. Sierra dos Vertentes. Watershed. — 224. Parima system of mountains. Distinct from the Andes. Terraces. — 225. The Sierra Parime. Other ridges. Loftiest summit of the chain rises abruptly, and forms the watershed between the tributaries of the Orinō′co and the Amazōn′. The other ridges, though not of great height, are very rugged, and are separated by plains, savannas, and immense forests. The peak of the Cêr′ro Duî′da, 7149 feet in height, is the loftiest summit of this system.

226. There are, altogether, upwards of thirty volcanoes in South America, in a state of activity. They all belong to the Andes, and consist of three distinct series — the series of Chî′le, of Perū′ and Bolî′via, and of Quî′to. The loftiest are the *Sahä′ma*, 22,350 feet, and *Gualatiê′ri*, 21,960 feet, which are in the Peruvian series.

§ 3. Plateaus of South America.

227. The table land, or Valley of Desaguadê′ro, is enclosed between the Cordillê′ra Reäl′ and the Cordillê′ra of the coast, at an elevation of nearly 13,000 feet above the level of the ocean. It is from 30 to 60 miles broad, and about 400 miles in length. The city of Potō′si and Lake Titicä′ca are situated in this valley, and in the eastern range are the lofty summits of Sorä′ta and Illimä′ni.

228. The Peruvian table land extends from the knot of Cūs′co to the knot of Lō′ja, in Ecuadōr′. The plateau of Quî′to, in Ecuadōr′, extends from the knot of Lō′ja to that of Päs′to, 270 miles in length and from 15 to 30 in breadth, with an elevation of 9500 feet. It is clothed with the verdure of perpetual spring, and is surrounded by some of the loftiest volcanoes in the world. No less than eleven snow-clad summits are visible from the plain, among which are Chimborä′zo, 21,424 feet, Antisä′na, 19,137 feet, Cotopăx′i, 18,875 feet, Tungurä′gua, 16,424 feet, and Pichĭn′cha, 15,924 feet.

229. The Brazilian table land occupies half the empire, with a part of Uruguāy′. Its form is triangular, one side extending along the shores of the Atlantic, from Rî′o de la Plä′ta nearly to the equator, thence west to the junction of the Bê′ni and Mamō′re Rivers. It is not over 2500 feet elevation.

Parima. — 226. Of volcanoes. The highest. — 227. Plateau of Desaguadero. City of Potosi and Lake Titicaca. Mounts Sorata and Illimani. — 228. Peruvian table land. Plateau of Quito. Volcanoes visible from the plain. — 229

§ 4. Declivities and Plains of South America.

230. The Lowlands of South America may be divided into three sections, corresponding to the three great rivers — the Amazōn′, the Orinō′co, and La Plä′ta.

231. The great plain of the Amazōn′ embraces all the central portion of South America, extending from the foot of the Andes to the sea and the mountains of Brazîl′. It comprises a large portion of Brazîl′, with parts of New Grenä′da, Ecuadōr′, Perü′, and Bolî′via. Its limits include nearly all the basin of the Amazōn′, with the lower parts of the Madêi′ra and Tocantîns′.

232. A large part of this plain is occupied by the sĕl′vas of the Amazōn′, which extend 1500 miles along the river, varying in width from 350 to 800 miles. The surface is more uneven than the pampas of the south, and covered with dense forests. North of the selvas are some marshy savannas, and south are some grassy stĕppes, but which, compared with the selvas, are insignificant.

233. The Llä′nos of the Orinō′co, in New Grenä′da and Venezuē′la, extend from the Caquê′ta River to the mouth of the Orinō′co, along the Guaviä′re and Mê′ta Rivers, and are of a dead level. They form a desert in the dry season; but in the wet season hundreds of square miles are inundated. These plains are so connected with those of the Amazon that the Cassiquiä′re flows from the Orinō′co into the Rî′o Nê′gro, a tributary of the Amazon.

234. The plain of the Rî′o de la Plä′ta is bounded on the west by the Andes, and on the east by the mountains of Brazîl′ and the Atlantic. It embraces the south-west part of Brazîl′, Paraguāy′, Buê′nos Ay̅′res, and part of Patagō′nia.

235. A large portion of this plain is known as the pampas of La Plä′ta, which are vast plains of grass, without trees or mountains. Some parts are swampy, others are barren, excepting in the wet season, when there is a rich covering of grass. The pampas sink to a low level along the foot of the Andes, where the streams from the mountains collect in large lakes and swamps.

236. Eastern Patagō′nia is a succession of gravelly plains

Brazilian table land. — 230. Three sections of lowlands. — 231. Plain of the Amazon. — 232. The selvas. Country north and south of the selvas. — 233. The Llanos of the Orinoco. Their condition in the dry and the wet seasons. Connection with the plains of the Amazon. — 234. Plain of the La Plata. — 235. Pampas of La Plata. Foot of the Andes. — 236. Eastern Patagonia. —

or terraces, at higher and higher levels, separated by long lines of cliffs. The ascent is small, for at the foot of the Andes the highest of these platforms is not over 3000 feet above the ocean level. The plains are here and there intersected by a ravine or a stream, the waters of which do not fertilize the soil. The desert extends to a few miles north of the Colorä′do.

237. The Andes descend to the eastern plains in Buê′nos Ay̅′res by a series of cultivated terraces. That of Tucumän′, 2500 feet elevation, is the garden of the state. On the western slope of the Andes little or no rain falls, except at their most southern extremity. That portion of Western Bolī′via which lies between the Andes and the Pacific is the Desert of Atacä′ma, in some parts of which no plant, no bird, no insect whatever is seen.

§ 5. River Systems of South America.

238. There are no large rivers flowing into the Pacific Ocean from South America, because the vast and lofty range of the Andes is on the western side of the continent, and at no great distance from the coast. Nearly all the waters of this continent flow into the Atlantic.

239. At the northern extremity of the Andes three rivers, parallel to each other, flow northerly into the sea — the Magdalê′na, the Câu′ca, and the Aträ′to. These drain the valleys in the north-west portion of New Grenä′da. In the eastern part of Brazîl′ the St. Francĭs′co River drains the valley between the mountain ranges parallel to the coast, keeping a northerly course till it reaches the 10th degree of south latitude, where it bends eastward and flows into the Atlantic. In the far south the Colorä′do and Nê′gro flow into the Atlantic.

240. South America has *three grand river systems:* first, the Orinō′co; second, the Amazōn′; and third, the La Plä′ta, all of which pour their waters into the Atlantic Ocean.

241. The basins of these three rivers are separated in their lower portions by the mountains and highlands of the Parî′ma and Brazîl′. The central parts of the basins of all

---

237. The Andes in Buenos Ayres. Western slope of the Andes. Desert of Atacama. — 238. Why are there no large rivers flowing into the Pacific from South America? Into what do most of the waters of this continent flow? — 239. Three rivers at the northern extremity of the Andes. River St. Francisco. The Colorado and Negro. — 240. Three grand river systems of this continent. — 241. Their basins how separated in their lower portions. Central parts

three, towards the foot of the Andes, form an extensive level, and are only divided from one another by imperceptible elevations in the plains, barely sufficient to form the watersheds between their tributaries. This peculiar structure is the cause of the natural canal of the Cassiquiä're, which connects the Upper Orinō'co and Rî'o Nê'gro.

242. The ORINOCO, the first of the great river systems of South America, rises in the Siĕr'ra del Parî'ma, 200 miles east of the Peak of Duî'da, and runs westerly until it receives the Guaviä're from the Andes. It then runs north, receiving the waters of the Mê'ta and Apŭ're coming from the west, and then, turning eastward, holds this course till it flows through several mouths into the Atlantic Ocean. The Orinō'co is navigable for 1000 miles at all seasons. The Mê'ta may be ascended to the foot of the Andes. The basin of the Orinō'co has an area of 300,000 square miles.

243. The AMAZON, forming the second great river system of South America, drains the eastern declivity of the Andes, from the equator to the 20th degree of south latitude. The Tungurä'gua, or Marañon', its highest source, flows from Lake Lauricō'cha in a plain 96 miles north-west of Lî'ma, and 60 miles from the Pacific. It takes at first a northerly course till it reaches Jaên', in 5½° S. lat.; thence it pursues an easterly direction of nearly 4000 miles to the Atlantic. The tide flows up 400 miles, and the river is navigable to the foot of the Andes. More than 20 superb rivers, navigable almost to their sources, pour their waters into it, besides numberless small streams. On its southern bank it receives the Huallä'ga and Ucayä'le from Peru; the Madêi'ra, its largest tributary, from Bolî'via; and the Topaȳ'os, Xĭn'gu, and Tocantîns', from Brazîl'. Its northern affluents are the Putumaȳ'o, Caquê'ta, and Rî'o Nê'gro. The Amazon and its tributaries drain an area of 2,500,000 square miles.

244. The RIO DE LA PLATA and its tributaries comprise the third great river system of South America. The estuary of this river is about 185 miles in length, and nowhere less than 30 miles in breadth, expanding at its entrance into the Atlantic to 150 miles. It is shallow and loaded with mud, which discolors the ocean for many miles from its mouth.

---

of the basins. The Cassiquiare River. — 242. Describe the system of the Orinoco. Area of the basin. — 243. Describe the Amazon. Its first course. From Jaen to its mouth. Tide and navigation. Navigable tributaries of the Amazon. Tributaries from the south. From the north. Area of the basin. — 244. The third river system of South America. Describe the Rio de la Plata. The Uruguay. The Parana. The Paraguay. The western tributaries of the

The La Plata is formed by the union of the Uruguāy′ and Paranä′. The Uruguāy′ rises on the western declivity of the Brazilian Mountains, and takes a south-westerly course of about 800 miles. The Paranä′ also rises on the same declivity, runs south-westerly for about 1000 miles, till it receives the Paraguāy′, when it bends towards the south to enter the La Plata. The Paraguāy′ rises from a chain of lakes on the southern slope of the Campō Pareī′cis, in Brazîl′, and pursuing a southerly course through nearly 14 degrees of latitude, joins the Paranä′ under the 27th parallel. The principal western tributaries of the Paraguāy′ are the Pilcomā′yo and Vermê′jo, both of which rise in the Andes of Bolivia. The Salä′do flows from the Andes in the northwest of Buê′nos Ay̅′res, through a south-easterly course of 800 miles, and joins the Paranä′ in 32° S. lat.

§ 6. LAKES OF SOUTH AMERICA.

245. The limited size of the principal lakes of South America presents a strong contrast with those of North America. There are many small lakes in the mountain valleys and table lands of the Andes, generally of considerable depth.

246. The great fresh water Lake of Titicä′ca, the largest and most celebrated in South America, is situated near the north-west frontier of Bolî′via, shut up in a broad valley, at an elevation of 13,000 feet. It has an area of more than 2000 square miles, and is more than 120 fathoms deep in many places, and surrounded by splendid scenery. It is fed by streams from both ridges of the Andes, and has an outlet through the River Desaguadê′ro, the waters of which are lost by evaporation and infiltration in the sandy soil through which it flows, and finally in the marsh of Aullä′gas.

247. There is a range of lakes along the eastern base of the Andes, but the greater part of them are mere lagoons, or marshes, some very large, which inundate the country to a great extent in the time of the tropical rains.

248. There appears to be a deep hollow in the surface of the earth at the point where Bolî′via, Brazîl′, and Paraguāy′ meet, in which lies the Lake Xaray̅′es, extending on each side of the River Paraguāy′; but, like many South Amer-

---

Paraguay. The Salado. — 245. Remark on the South American lakes. Lakes of the Andes. — 246. Lake Titicaca. Its area and depth. Sources and outlet. — 247. Lakes at the base of the Andes. — 248. — Lake Xarayes. Lakes in ican lakes, it is not permanent. Salt and fresh water lakes are numerous on the plains of the Rī′o de la Plä′ta, and near the Andes of Patagō′nia.

§ 7. Geology of South America.

249. One of the most singular circumstances in the formation of the Andes chain is the enormous thickness and height of what geologists call the secondary formation. Humboldt asserts that beds of coal have been found in the neighborhood of Santa Fé, at an elevation of 8650 feet above the level of the sea; and even at the height of 14,700 feet, near Huanŭ′co. The plains of Bogotä′, which are about 9000 feet in elevation, are covered with sandstone, gypsum, shell limestone, and in some places rock salt. Fossil shells have been found in Peru at 12,800 feet in one place, and at 14,120 feet in another, where they were also accompanied with sandstone. The basalt of Pichincha, near the city of Quito, has an elevation of 15,500 feet; while granite, which crowns the loftiest mountains of Europe, is not found higher than 11,500 feet in the Andes, and is scarcely known in Ecuador or Peru. The lofty summits of Sorata, Chimborazo, and others consist entirely of porphyry, which constitutes a mass of 10,000 or 12,000 feet in thickness, together with an enormous body of quartz, of 9500 feet thick. The Chilian Andes differ in their composition from the other parts of the chain; for it is in the cordillera of this part that vast blocks of crystal are found, capable of being formed into columns six or seven feet in length. The pampas of Buê′nos Aȳ′res are entirely alluvial. Granite prevails to the extent of 2000 miles along the coast of Brazîl′, and, with si′enite, forms the base of the table land. The superstructure of the table land consists of metamorphic and old igneous rocks, sandstone, clay slate, limestone, in which are large caverns with bones of extinct animals, and alluvial soil. Tō′paz, am′ethyst, and other gems are abundant. Brazîl′ produces more diamonds than any other country.

---

the plains of La Plata. —249. Geology. Formation of the Andes. Basalt of the Pichincha. Granite. Sorata, Chimborazo, &c. Chilian Andes. Pampas of Buenos Ayres. Brazilian coast. Superstructure of the table lands.

Table of Minerals of South America.

Diamonds. — Brazîl′.
Other Precious Stones. — Brazîl′, New Grenä′da, Chî′le, and Peru′.
Gold. — New Grenä′da, Ecuadōr′, Peru′, Bolî′via, Chî′le, Brazîl′, and Lä Plä′ta.
Silver. — Bolî′via, Peru′, Chî′le, and Lä Plä′ta.
Tin. — Peru′.
Mercury. — Peru′.
Copper. — Peru′ and Chî′le.
Iron. — Brazil′ and Peru′.
Coal. — Peru′ and Chî′le.
Salt. — Lä Plä′ta, Brazîl′, Venezuē′la, New Grenä′da, Bolî′via, and Peru′.
Saltpetre. — Peru′.

§ 8. Questions for Review.

250. What general form of contôur′ has South America?

What features in the reliefs of the continent appear to have determined its outline?

Name the several systems of highlands.

Which is the chief system?

Towards which ocean is its long slope?

Which are the five principal mountain knots of the Andes?

What and where is the loftiest summit of the Andes?

Is the chain single or double between the Straits of Magĕl′lan and the knot of Pōr′co?

Which is the most important pass across the Chilian Andes?

Between what knots are the Cordillê′ra Reäl′ and the Cordillê′ra of the coast?

What valley is enclosed between these ridges?

Which are the principal summits in the eastern ridge? Their respective heights?

Describe the knot of Cus′co.

What important river valleys between the ridges north of the knot of Päs′co and Huanu′co?

How is the plateau of Qui′to situated? Its elevation?

Name the principal ridges of the Brazilian Mountains. Their highest point.

What watershed is formed by the Siĕr′ra dōs Verten′tes? Its greatest elevation?

How many and what ridges in the northern portion of the Andes?

Which of them passes towards the Isthmus of Panamä′?

Describe the *Parî′ma system* of mountains.

Which is the principal ridge?

Which the highest point?

In which mountain system are the principal volcanoes?

How many distinct series of volcanoes, and in which state is each?

Which are the two highest?

What is the elevation of the valley of Desaguadê′ro above the level of the sea?

What lake and city are situated in this valley?

What five noted summits are visible from the plateau of Quî′to?

By what is the intervening space between the Andes, the Parî′ma, and the Brazilian Mountains occupied?

Into what three basins are these lowlands divided?

What states and countries are included in the plain of the Amazon?

What are the *selvas*?

Describe the *llä′nos* of the Orinō′co.

What are the limits of the plain of the Lä Plä′ta?

What states does it include?

What are the *pampas*?

What desert places in South America?

What is the area of the basin of the Orinō′co?

What rivers belong to this basin?

What northern rivers belong to the basin of the Amazon?

What is there remarkable in the watershed between the Orinō′co and Amazon basins?

What rivers from the *south* belong to the basin of the Amazon?

Which is the most western source of the Amazon?

What is the area of the basin of the Amazon?

What two large rivers unite to form the Lä Plä′ta?

What other rivers belong to this basin?

What three rivers from the Andes flow north into the Caribbē′an Sea?

Describe the St. Francĭs′co River.

What rivers flow into the Atlantic south of the Rî′o de la Plä′ta?

What becomes of the surplus waters of the Lake Titicä′ca?

What peculiarity marks many of the lakes of South America?

Why are there no large rivers on the west of the Andes?

How far is the Amazon navigable?

Between what parallels does the Amazon hold its course?

Between what parallels is the broader portion of the continent situated?

Does this portion consist of highland or lowland chiefly?

CHAPTER VIII.

SPECIAL GEOGRAPHY OF EUROPE.

PREPARATORY EXERCISES ON THE MAP OF EUROPE.

251. WHAT ocean north of Eū′rope? West?
What continent joins it on the east?
By what branches of the Atlantic is it indented?
What passage leads into each of these?
What waters penetrate the northern coast?
Name the branches of the Bâl′tic Sea.
Name the branches of the Mediterranean.
What waters separate Great Britain and Ireland?
Chief islands in the Mediterranean?
Where is Iceland situated?
What separates England from France?
What four peninsulas in the south of Europe?
What five seas in the south of Europe?
How is the Spanish peninsula bounded?
How is the Italian peninsula bounded?
What is the situation of Greece?
What is the situation of Crimē′a?
What peninsulas in the west and north-west of Europe?
What states occupy the Scandinā′vian peninsula?
Of what state is the Jut′land peninsula a part?
Which are the chief capes of Norway?
What and where are the Skăg′er Rack and Căt′tegat?
Where are Capes Or′tegal and Finistêrre′?
What capes south of Pōr′tugal?
Where are Capes Spartivĕn′to and Păs′saro?
What cape south of Greece?
What islands west of Greece?
Between what parallels of latitude is Europe?
Between what meridians?
What empire occupies the east of Europe?
What states join Russia?
What states in Western Europe?
Where is Portugal?
What countries surround the Bâl′tic?
How is the Bay of Bĭs′cay situated?
What countries do the British Isles include?

What countries around the North Sea?
What inland sea on the south-east of Europe?
What groups of islands west and north of Scotland?
What group west of Norway?
Chief islands in the Bâl′tic?
Where are the Sea of Kä′ra and White Sea?
What and where is the Naze?
What group of islands east of Spain?
Where is the Gulf of Gĕn′oa?
What large islands due south of Gĕn′oa?
Where is Sicily?
What strait on the east?
Trace the waters of the Don River to the ocean.
What straits or sounds lead into the Bâl′tic Sea?
What countries around the Archipĕl′ago?
What sections of the United States correspond with the south of Europe in latitude?

§ 1. Extent and General Features of Europe.

252. E[illegible]ROPE appears as an appendage of Asia, projecting westward, partially separated from it by water, but united with it by the U′ral and Caucä′sian Mountains. It is bounded on the north by the Arctic Ocean, on the west by the Atlantic, and on the south by the Mediterranean and Black Seas. The eastern boundary is formed by the U′ral Mountains, U′ral River, and Căs′pian Sea, which separate it from Asia. It extends from 36° to 71° N. lat., and from 9½° W. to 67° E. lon. Its surface is estimated at 3,900,000 square miles, and its coast line at 17,000 miles, or 1 mile of coast for every 229 miles of surface. Europe embraces the national divisions of Rŭs′sia, Swē′den, Norway, Prŭs′sia, Austria, Denmark, Germany, Holland, Belgium, France, Spain, Portugal, Switzerland, Italy, Turkey, and Greece, on the continent, and the British Isles lying westward.

253. The mass of Europe is deeply indented in all parts by the ocean, and by inland seas. The Grecian and Scandinā′vian peninsulas seem to be made up of many smaller peninsulas. The inland seas, and the portions of the ocean included within the outer limits of Europe, form nearly half its surface. The Atlantic, penetrating the western border, forms the North Sea, Bâl′tic Sea, Gulf of Bŏth′nia, Gulf of Fin-

---

252. EUROPE. Of Europe in relation to Asia. Boundaries. Extent. Area. Coast line. National divisions. — 253. Indentations of the coast. Proportion

land, Gulf of Rî'ga, English Channel, Bay of Bĭs'cay; and by the Strait of Gibrâl'tar forms the Mediterranean Sea, Gulf of Lȳ'ons, Gulf of Gĕ'noa, Gulf of Tä'ranto, the Adriatic, Grecian Arçhipĕl'ago, Mar'mōra, Black, and Az'of Seas. The Arctic Ocean in the north forms the White Sea, Tcheskā'ia Gulf, and Sea of Kä'ra.

254. In Europe, instead of vast table lands and chains of mountains separating it into distinct regions, we find the highlands and lowlands intermingled. Valleys and streams intersect all the highlands, and plains divide the mountains into groups of moderate size. The surface of Europe may conveniently be considered under four principal divisions, viz., the Central Highlands, or European portion of the great mountain zone of the old world; the Southern Peninsulas; the Northern Highlands; and the Great Europē'an Plain.

§ 2. The Central Highlands of Europe.

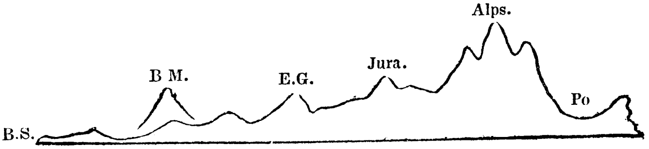
255. The Europē'an portion of the great mountain zone comprises three principal groups or systems, viz., the Pyrenē'an, the Al'pine, and the Balkăn' systems.

256. The Pyrenees Mountains extend from the Bay of Biscay to the Mediterranean Sea, a distance of 270 miles. The breadth of the range is about 60 miles; the average height is nearly 8000 feet, being higher in the east than in the west. On the French declivity the descent is steep, rugged, and notched. The highland is continued through the south of France, at a much lower elevation, by chains of hills and table lands. The most remarkable of the French system are the mountains of Auvĕrgne', and the Cevĕnnes', which reach the right bank of the Rhōne, and form the link between the more elevated masses of Western and Eastern Europe.

257. The Alpine System constitutes the highest and most extensive mountain range in Europe, if we except the Caucä'sian Mountains, which lie on the southern boundary between it and Asia. They extend from the Rhone, in France, to Dalmā'tia, on the east of the Adriät'ic Sea: hence they occupy the space between the 5th and 18th degrees of east

---

of water surface. Branches of the Atlantic. Of the Arctic. — 254. Disposition of the highlands and lowlands. Intersections. Four divisions of its surface. — 255. Three groups of the central highlands. — 256. The Pyrenees. Mountains of France. — 257. Of the Alps. Their extent. Their course between the Rhone and the Po to Mont Blanc. Valleys of this portion. The valleys as longitude, forming a vast semicircular bulwark on the north of Italy and the Adriăt′ic. Between the basin of the Pō River and the valley of the Rhōne the mountain mass reaches from the shore of the Mediterranean, bending round by the west and north, to Mont Blänc, in Savoy′. The valleys to the east and west branch off at right angles from the watershed. Those to the east are short, straight, and deep, terminating in the basin of the Po; those to the west are of much greater length, and rather winding. The peculiar disposition of these valleys has rendered the communication between France and Italy comparatively easy. The roads follow the valleys up to the watershed, and have then only to traverse one high ridge. Three great carriage roads lead over it: the southern one is the road of Mount Genê′vre, 6197 feet at the summit; the middle road is that of Mount Cenîs′, 6784 feet, and is by far the most used of all the roads over the Alps; the northern carriage road is that of the Little St. Bernärd′; its highest point is 7200 feet.



Section of Europe from the Baltic to the Apennines.

B. S. — Baltic Sea.
B. M. — Brocken Mountain.
E. G. — Erz Gebir′ge.

Jura Mountains.
Alps.
Valley of the Po.

258. At Mont Blänc the direction of the range changes to east north-east, and runs through the Grisōns′ and Tȳr′ol to the Great Glŏck′ner, in 40° 7′ N. lat. and 12° 43′ E. lon., where the higher Alps terminate a course of 420 miles long. East of Mont Blänc two high ridges enclose the valley of Valāise′. In the chain on the north of this valley the greatest Europē′an glă′cier is found, not far west of the source of the Rhōne. Here a great part of the chain rises above the snow line, and is always covered with ice, and comprises an area of 200 square miles.

259. The most elevated part of this chain lies between the

---

avenues between France and Italy. Carriage roads over the Alps. — 258. Course of the higher Alps from Mont Blanc. Valley of Valaise. The great glacier. — 259. Space between the Col de la Seigne and the Simplon. The central ridge. —

Col de la Sêigne and the Sĭm′plon. The highest mountains in Europe are comprised within this space, which is not more than 60 miles long, and where Mont Blänc, the highest of all, rises 15,759 feet above the level of the sea. The central ridge of the higher Alps is jagged with peaks, pyramids, and needles of bare and almost perpendicular rock, rising from fields of perpetual snow and rivers of ice to an elevation of 14,000 feet.

260. Many parallel chains and groups send their flanks far into the lower grounds. Innumerable branches, hardly lower than the main crest, diverge from it in all directions; of these the chain of the Bernēse′ Alps is the highest and most extensive. It separates at the Mount St. Gōt′hard, in a line parallel to the principal chain, forming one of the most remarkable groups of mountain scenery in Europe.

261. An interesting part of the Alpine system is the chain of the Swiss Jū′ra, commencing south on the banks of the Rhōne, and running north-east to the junction of the Rhīne and Aär, a distance of 160 miles, with an average breadth of 30 miles. The Jū′ra consists of several long parallel chains, enclosing narrow longitudinal valleys. The slope of the Jū′ra is rapid on the Swiss side, but more gentle towards France; and the ridge, as seen from a distance, presents a regular undulating line, with rounded, dome-like summits. Unlike the Alps, the chain of the Jū′ra is clothed from base to summit with luxuriant pine forests.

262. At the Great Glŏck′ner the main chain divides into two branches — the Nō′ric and Căr′nic Alps; the latter is the continuation of the chief stem. At Mont Terglôu′ it takes the name of Julian Alps, and runs east till it joins the Balkăn′ under the 18th meridian.

263. The Hyrcā′nian, Sudĕt′ic, and Carpā′thian Mountains form the northern boundary of these highlands. The first, consisting of three parallel ridges, extends from the right bank of the Rhīne to the centre of Germany, about 51° N. lat., on the confines of Bavā′ria and Bohē′mia. The Sudĕt′ic Mountains begin on the east of this group, and, after a circuit of 300 miles around Bohē′mia, terminate at the small elevated plain of the Upper O′der, which connects them with the Carpā′thian Mountains. The country to the south of these limiting chains, between them and the Alps, is covered

---

260. Of parallel chains. The Bernese Alps. — 261. The Swiss Jura. Slopes of the Jura. Forests. — 262. Division of the Alps at the Great Glockner. — 263. Northern limit of the Central Highlands. The Hyrcanian Mountains. The Sudetic Mountains. The country south of these chains. Width of the

with an intricate network of mountains and plains of moderate elevation. The width of the higher Alps is about 100 miles, increasing to 150 miles east of the Grisŏns′, and to 200 miles between the 15th and 16th meridians, but is not more than 80 miles where it joins the Balkăn′ Mountains.

264. The Balkăn′ range extends 600 miles, from the Julian Alps to the Black Sea. It begins by a table land 70 miles long, traversed by low hills, ending in precipitous rocks 7000 feet high. Rugged mountains succeed to this, with snow-clad summits. Another table land follows, extending to Mount Arbē′lus, near the town of Sophia, where the Hē′mus Mountains begin. These run in parallel ridges, separated by valleys, to the Black Sea, dividing the plains between the Lower Dăn′ube and the Propŏn′tis into nearly equal parts. The Balkăn′ system of mountains is every where rent by terrific fissures across the chains and table lands, so deep and narrow that daylight is almost excluded. These chasms afford the safest passes across the range.

§ 3. The Southern Peninsulas of Europe.

265. The Spanish Peninsula consists chiefly of table land traversed by parallel ridges of mountains. The Cantä′brian chain extends from the Pȳr′enees westward to Cape Finistêrre′, on the Atlantic. On the Spanish side of the Pȳr′enees, gigantic sloping offsets, separated by deep valleys, extend to the banks of the E′bro. The Ibê′rian range diverges at right angles from the Pȳr′enees, and extends southwards nearly through the whole of Spain. From this range various collateral branches again diverge, generally taking a south-westerly course. Of these the most northerly is the rugged and romantic Castĭl′ian range, which extends into Portugal; then follow the Siĕr′ra de Toledo, the Siĕr′ra Morê′na and the Siĕr′ra Nevä′da. The table land is bare of trees. The plains of old Castîle′ are bare and uncultivated, except along the banks of the rivers. The maritime provinces on the Mediterranean and those of Portugal are luxuriant and beautiful. Central Spain, embracing the two Castîles′, is the most considerable table land of Europe, having a general elevation of 2000 feet above the

---

higher Alps. — 264. The Balkan range. Table land. The Hemus Mountains. Fissures and chasms. — 265. Spanish peninsula. Cantabrian chain. Spanish side of the Pyrenees. Iberian range. South-westerly collateral branches. Of the table lands, plains, and maritime parts. Plateau of Central Spain. —

sea level. The descent from it is, on all sides, very steep, and the transition from the almost treeless plains of Castîle′ to the milder climate and luxuriant vegetation of the lowlands, at the foot of the plateau, is very striking.

266. The ITALIAN PENINSULA is traversed by the Ap′ennines, beginning at the *Măr′itime Alps*, enclosing the Gulf of Gĕn′oa, and running in parallel ridges to the middle of Calä′bria. There they separate into two branches, one of which goes to Cä′po de Leŭ′ca, on the Gulf of Tä′ranto, the other to Cape Spartivĕn′to, in the Strait of Messî′na, and reappearing in the Island of Sĭ′cily. The mountains of Sardîn′ia and Cŏr′sica are outlying members of the Măr′itime Alps.

267. The GRECIAN PENINSULA is a country of mountains. The chains terminate in bold, projecting headlands, which reach far into the sea, and reappear in the numerous islands and rocks that dot the coast. The Grecian mountains, like the Balkăn′, are torn by transverse fractures.

§ 4. NORTHERN HIGHLANDS OF EUROPE.

268. The SCANDINĀ′VIAN SYSTEM OF MOUNTAINS, from which the peninsula takes its name, extends from the southern point of Norway, along the western coast, for 1000 miles, in a north-east direction, terminating at Cape North, on the Arctic Ocean. Its highest elevation is 8400 feet. The southern portion of the chain is called the Hardăn′ger-field, and consists of ridges following the general direction of the range 150 miles broad. At a distance of 360 miles from the Naze the mountains form a single elevated mass, called the Dŏv′re-field, terminating in a table land 4500 feet high. It slopes towards the east, and plunges at once into a deep sea on the west. The northern section of the chain is called the Kĭ′olen Mountains. The coast of Norway is a continued series of rocky islands, capes, promontories, and precipitous cliffs, rent into fiords or chasms, which penetrate for miles into the heart of the mountains. The valleys in Sweden along the eastern side of the chain abound in forests and lakes.

269. The mountains of the BRITISH ISLES and those of

---

266. Italian peninsula. The Apennines. Mountains of Sardinia and Corsica. — 267. Grecian peninsula. — 268. Scandinavian mountains. The Hardanger-field. The Dovre-field. The Kiolen Mountains. Coast of Norway. Sweden. — 269. Mountains of the British Isles. Scotland in the north-west. Scottish mountains. The Grampian Hills. Ben Nevis. Western part of Scotland.

the north-eastern parts of Iceland have a similar character, and follow the same general directions as those of Scandinā′via, and are therefore considered as belonging to the same system. The Fĕr′oe Islands rise at once in a table land, 2000 feet high, bounded by precipitous cliffs. The rocky islands of Shet′land and Ork′ney form part of the Scottish system. The north-west part of Scotland is a table land, from 1000 to 2000 feet high, which ends abruptly in the sea, covered with heath, peat mosses, and pasture. The general direction of the Scottish mountains is from south-west to north-east, divided by a long line of lakes in the same direction, extending from near the Isle of Mŭll completely across the island to Mŏr′ay Firth. The Grăm′pian Hills, with their spurs, fill the greater part of Scotland north of the Clȳde and the Fōrth. *Bĕn Nĕv′is*, 4368 feet above the level of the sea, is the highest mountain in the British Isles. The western part of Scotland is a wild country. Along the Atlantic coast it bears a strong resemblance to that of Norway. It is thought probable that the Hĕb′rides Islands once formed a part of the main land, since they follow the same direction of the mountain system in two parallel lines of islands of rugged and imposing aspect. The undulating country on the borders of Scotland becomes higher in the west of England and north of Wales, where the hills are wild, though the valleys are in a high state of cultivation. IRELAND is mostly a mountainous country, the Atlantic coast presenting the same wild aspect as seen in the neighboring islands; but it is rich in arable land and pasture, and abounds in fresh water lakes.

270. The URAL CHAIN OF MOUNTAINS, forming the boundary between Europe and Asia, is the only interruption in the level of the great northern plain, and is wholly separate from any other mountain system. This chain begins on the right bank of the U′ral River, in about the 51st parallel of north latitude, and runs due north to the Gulf of Kä′ra. It consists of three sections — the northern, middle, and southern U′rals. Their peaks do not generally exceed 5000 feet in height. The breadth of the range varies from 40 to 120 miles. The descent on both sides is so gentle that in many places it is difficult to determine where the plain begins.

West of England and north of Wales. Ireland. — 270. The Ural Mountains.

§ 5. THE GREAT EUROPEAN PLAIN.

271. The GREAT EUROPEAN PLAIN occupies more than two thirds of the continent, extending from the North Sea eastward along the southern shores of the Bâl′tic, as far as the U′ral Mountains, and from the shores of the Black Sea on the south to those of the Arctic Ocean on the north. Through the whole of this tract, which comprehends Holland, North Germany, the greater part of Prŭssia, and the whole of Europē′an Rŭs′sia, there scarcely occurs any elevation deserving the name of a hill.

272. The mean height of the low provinces of France is 480 feet. Mŏs′cow, the highest point of the Europē′an plain, is also 480 feet, from which the land slopes imperceptibly towards the sea, both on the north and the south, till it really dips below its level. Holland would be overflowed were it not for its dikes. At Astrakan, on the Cas′pian Sea, the plain sinks still lower than in Holland.

273. The Europē′an plain is highly cultivated and very productive in the western and middle regions and along the Bâl′tic. A large portion of the plain is pasture land, and wide tracts are covered with forests, especially in Pō′land and Rŭs′sia. The quantity of swamp and waste land in Europe is also great. Towards the eastern extremity the plain assumes the peculiar character of desert called stĕppes, a level waste destitute of trees, commencing at the River Dniē′per, and extending along the shores of the Black Sea.

§ 6. RIVER SYSTEMS OF EUROPE.

274. Europe stands preëminent among the continents on account of its extensive water surface. Its numerous peninsulas, and the deep indentations of its coast by the ocean and by inland seas, render it the most accessible for commercial intercourse.

275. It comprises two principal water systems, each of which may be subdivided into as many natural divisions, or basins, as it has primary rivers. In the west, the Alps and

---

Their extent. Sections. Descent. — 271. The great European plain. Countries included. Elevation. — 272. Particular heights. — 273. Of cultivated and waste lands. Steppes. — 274. The water surface of Europe compared with the other continents. Facilities for commerce. — 275. Two principal water systems. The dividing line in the west. The watershed in the eastern parts. Waters the German mountains divide the waters that flow into the Atlantic from those that flow into the Mediterranean and Black Seas. In the eastern parts, a watershed exists on the great plain, beginning on the northern declivity of the Car-pā′thian Mountains, at about the 23d meridian, in a low range of hills. It runs between the sources of the Dniē′per and Vĭs′tula, and winds along the plain to the Văl′dai table land, which is the highest point. It then declines northward towards Lake Onē′ga, in about the 60th parallel, and lastly bends round to the sources of the Kä′ma in the U′ral Mountains. The waters north of this watershed flow into the Bâl′tic and White Seas, and those on the south flow into the Black and Căs′pian Seas. The streams north of the general watershed are very numerous; those on the south are of greater magnitude.

276. The systems of the Vŏl′ga and Dăn′ube Rivers are the most extensive in Europe. The Volga has a basin comprising 653,000 square miles, and is navigable throughout most of its course. It rises in a small lake on the slopes of the Văl′dai table land, at an elevation of 550 feet, and falls into the Căs′pian Sea, which is 83 feet below the level of the Black Sea; so that it has a descent of 633 feet in a course of 2000 miles. It carries to the Căs′pian one seventh of all the river water of Europe. The U′ral River also falls into the Căs′pian.

277. The Danube drains a surface of 312,000 square miles, traversing the whole of Southern Germany, Hungary, and Turkey. It receives 60 navigable tributaries, among which are the Inn, the Dräve, the Säve, the Theĭss, and the Prŭth. The quantity of water discharged by the Dăn′ube is nearly equal to that of all the other rivers flowing into the Black Sea. It rises in the Black Forest, in Germany, at an elevation of 2850 feet, giving it a current of considerable velocity, which, with rocks and rapids, impedes its navigation in many places. From Orsō′va to the Black Sea it flows in a gentle current, and is navigable for large vessels. Its length is 1725 miles. The Dniē′per and Dniēs′ter also flow into the Black Sea. The Dŏn falls into the Sea of Az′of.

278. The River Po rises on the confines of France, from Mount Vĭ′so in the Alps, and flows eastward to the Adriatic. It divides the extensive and rich plain of Lombardy into two

---

north of this watershed. South. Contrast. — 276. The Volga and Danube systems. Basin of the Volga. Its source and termination. Descent. Volume. The Ural River. — 277. Basin of the Danube. Chief tributaries. Volume of water. Source. Length. Dnieper and Dniester. Don. — 278. Describe nearly equal parts, and is the great receptacle for the streams flowing south from the Alps, and for those that flow north from a part of the Ap′ennine range. This plain is about 250 miles long, and from 50 to 120 miles wide, including the whole of the Lombär′do-Venē′tian kingdom, the central portion of Sardîn′ia, most of Pär′ma and Mō′dena, and the northern parts of the Pā′pal States.

279. The Rhone River rises in Switzerland, west of Mount St. Gōt′hard, at an elevation of 5780 feet, and flows, at first, westerly to the Lake of Genē′va. On leaving the lake it takes a south-west direction, passing between the Alps and Jū′ra chain into France, till it receives the waters of the Saōne coming from the north. From thence it flows south, and enters the Gulf of Lyons by four mouths. Its length is 645 miles. The Cevĕnnes′ Mountains form the western boundary of the basin of the Rhōne, and the Alps the eastern. This river passes through one of the most beautiful and delightful regions of the world. It is one continued vineyard, sheltered by mountains from 500 to 2000 feet height, and dotted all over with large towns, villages, cottages, and neat villas.

280. The Rivers of Spain form as important a feature as its mountains. The Doŭ′ro and the Tā′gus, rising in the Ibē′rian chain, traverse the two central plains, and flow through Portugal into the Atlantic. The Guadiä′na, on its approach to Portugal, forms the boundary between it and Spain. The Guadalquivîr′ is wholly within Spain, and has on its banks the cities of Cŏr′dova and Sevîlle′, with Cā′diz not far from its mouth. It is the only river in Spain of much commercial importance. The E′bro, from the Cantăb′rian Mountains in the north, flows south-east into the Mediterranean.

281. The greater part of France is composed of river basins, separated by mountains and hills, which expand into plains as they approach the coast. Besides the Rhōne, heretofore described, there is the Garōnne′ in the south, and the Loire (Lwär) in the centre, both flowing into the Bay of Biscay; the Sêine in the north-west, flowing into the English Channel; and the Rhīne on the eastern boundary.

282. The Rhine deserves a more particular description. It is formed in the Grisōns′ by the union of three streams;

---

the Po. Extent of the plain of Lombardy. — 279. The Rhone. Eastern and western boundary of its basin. Of the regions watered by this river. — 280. Rivers of Spain. The Guadalquivir. The Ebro. — 281. River basins of France. Chief rivers. — 282. Sources of the Rhine. From Lake Constance to the Rheinfells. Division between the Upper and Lower Rhine. Its course, &c., from Basle. Tributaries above and below Basle. Extent of the basin of the Rhine. Com the first of which issues from the north side of Mount St. Gōt′hard, at an elevation of 6580 feet; and flowing north, receiving many torrents and streams in its descent, it enters Lake Constance. Leaving the lake at the west end, it flows westward to Schaffhäŭ′sen, and 3 miles below it falls over a ledge of rocks 80 feet in height, forming the celebrated cataract of the Rheīn′fells. The river keeps its western course through a rocky valley as far as Bäsle, which is 827 feet above the level of the North Sea, and is the point of division between the Upper and Lower Rhīne. Here, turning north, its navigation commences; and leaving Switzerland, it forms the boundary between France and Bä′den, flowing on north and north-west through Germany and Holland, till it falls into the North Sea. Its length is 600 miles. The chief tributaries of the Rhīne are the Aär above Bäsle, and the Nĕck′ar, Māyne, Mosĕlle′, and Meūse, below. The basin drained by the Rhīne and its affluents comprises more than 65,280 square miles. In a commercial point of view the Rhīne is, perhaps, the most important river in Europe, owing to the numerous states to which it affords a water conveyance. The whole of Holland is a collection of deltoid islands, formed by the Rhīne, the Meūse, and the Sçhĕldt.

283. The great plain which forms the north of Germany, Prŭs′sia, and Pō′land is traversed by several large rivers and their tributaries. The Wē′ser rises on the northern slope of the Rhōn′gebîr′ge, and flowing north for 250 miles, falls into the North Sea. The Elbe, a large and important river, flows from the Bohē′mian Mountains, generally in a north-west course, for 550 miles, and also falls into the North Sea. The O′der rises in Morā′via, from the Sudĕt′ic and Carpā′thian Mountains, at an elevation of 1800 feet, and flows north-west through the centre of Prŭs′sia to the Bâl′tic Sea. The Vĭs′tula rises in Morā′via, in a branch of the Carpā′thians, near the frontier of Galĭ′cia, and flows northerly through the centre of Pō′land into the Gulf of Dänt′zic, an arm of the Bâl′tic Sea. Its length is 530 miles.

284. The principal rivers which drain the western and northern parts of Rŭs′sia are the Niē′men, which flows into the Bâl′tic; the Dŭ′na, into the Gulf of Rī′ga; the Onē′ga, Dwī′na, and Mezēne′, into the White Sea; and the Petschō′ra, into the Arctic Ocean.

285. Throughout the lowlands of Europe the navigable

---

mercial importance of the Rhine. Holland. — 283. Of Northern Germany, Prussia, and Poland. Describe the Weser. The Elbe. The Oder. The Vistula. — 284. Rivers of the west and north of Russia. — 285. Of canals. Rivers streams are connected by numerous canals, which greatly facilitate the inland navigation. The river systems of the British Isles, in connection with their canals, afford facilities for transportation not exceeded by those of any other country. The surface of England is traversed by a network of water-courses equal in extent to 5430 miles.

§ 7. Lakes of Europe.

286. The lakes of Europe may be grouped into two systems — those of the great northern plain, and those of the mountain mass. The chief of those in the lowlands are the Lake Ladō′ga and Lake Onē′ga, of Rŭs′sia, and Lake Wĕn′ner and Lake Wĕt′ter of Sweden. A large part of Finland is covered with lakes.

287. The mountain system of lakes comprehends those of the Pўr′enees, the Alps, and the Ap′ennines. The lakes of the Pўr′enees are chiefly on the French side. There is scarcely a valley in the Alpĭne range without its sheet of water. The most elevated is that of Lake Toüb, 7200 feet above the level of the sea.

288. There are more lakes on the north than on the south side of the Alps: the German valleys are full of them. The Lake of Genē′va, from its situation, the pure azure of its waters, and the sublime mountain scenery, is the largest and most beautiful of all the Alpine lakes. Its surface contains about 240 square miles; it is 1230 feet above the level of the sea, and in one place is 1012 feet deep. There are also the lakes Lucĕrne′, Brîenz′, Cŏn′stance, and the Italian lakes Cō′mo, Maggiō′re, Lugä′no, and Gär′da. These lakes are fed by rivers rising in the glă′ciers of the higher Alps, and many large rivers flow from them.

§ 8. Geology of Europe.

289. Among the chief primary rocks of the great table land of Europe are granite, gneiss, and sienite. In the Alpine ranges west of St. Gothard, calcareous rocks abound, often intermixed with clay slate and mica slate; east of St.

---

of the British Isles. — 286. Two systems of lakes in Europe. Chief of the lowland lakes. — 287. Mountain lakes. Lakes of the Pyrenees. Alpine lakes. — 288. Lakes north of the Alps. Lake of Geneva. Other important lakes. Their sources. — 289. Geology of Europe.

Gothard the central chain is accompanied by lofty calcareous ranges, full of caverns. Granite is abundant in most European countries where primary formations are met with; gneiss is the rock in which the Saxon, Bohemian, and Australian metallic veins are situated. Transition limestone, which furnishes some of the best ornamental marbles, occurs in the north and west of England, south of France, the Alps and Pyrenees; graywacke, in which numerous metallic ores reside, abounds in Germany, Transylvania, the north of Italy, &c. Coal exists extensively in the British Islands, Sweden, France, Germany, Bohemia, &c.; chalk is a formation almost peculiar to Europe, extending throughout the greater part of England, the north of France, and parts of Poland, Russia, Sweden, and Spain. Tertiary beds, containing a great number of fossils, exist in various parts of Europe; the most noted are those of the London and Paris basins. Mineral springs in great variety abound in Europe.

TABLE OF MINERALS OF EUROPE.

DIAMONDS. — Russia.
OTHER PRECIOUS STONES. — Bohemia, Hungary, Transylvania, and Saxony.
GOLD. — Russia, Austria, Hungary, and Sardinia.
SILVER. — Austria, Hungary, Saxony, Hanover, Turkey, Greece, Prussia, England, France, Sweden, Norway, and Sardinia.
TIN. — England, Saxony, and Bohemia.
MERCURY. — Spain, Austria, Bavaria.
COPPER. — Great Britain and Ireland, Russia, Austria, Sweden, Norway. Turkey, Greece, Prussia, Spain, France, and Hanover.
IRON. — Europe, (every where.)
LEAD. — Spain, Great Britain and Ireland, Austria, Prussia, Hanover, France, Saxony, and Sardinia.
ZINC. — England, Belgium, Prussia, and Austria.
COAL. — Great Britain and Ireland, Belgium, France, Prussia, and Austria.
SALT. — Russia, Austria, France, Spain, Great Britain and Ireland, Portugal, Prussia, Turkey, Sardinia, Bavaria, Italy, Norway, Sweden, and Greece.

§ 9. Questions for Review.

290. What is there remarkable in the contôur′ of Europe?

What is the principal feature in the reliefs?

What proportion of the surface of Europe is water?

Into how many and what principal divisions may the surface be divided?

What three groups or ranges compose the Central Highlands?

Which is the western range? Its average height?

What mountains in France?

What is the extent of the Alps Mountains?

What are the situation and height of Mont Blänc? Course of the Alps from Mont Blänc to the Great Glöck′ner?

Where is the greatest Europe′an glă′cier found?

By what is the central ridge of the higher Alps characterized?

At what point do the Bernēse′ Alps diverge from the main crest?

Describe the Jū′ra Mountains.

What two branches diverge from the Great Glŏck′ner?

What mountains form the northern boundary of the Central Highlands?

Where is the Balkăn′ range?

What is their character?

Of what does the Spanish peninsula consist?

Name the principal ridges that traverse the peninsula.

What mountains traverse the Italian peninsula?

What islands are considered as outlying portions of the Măr′itime Alps?

What is the character of the Grecian peninsula?

Describe the Scandinā′vian Mountains.

What characterizes the Norwē′gian coast?

What other mountains are considered as belonging to the Scandinā′vian system?

Which is the highest summit of the British Isles?

What chain running north and south separates Asia from Europe?

What chain running east and west?

How much of the continent is comprised in the great European plain?

What countries are included in this tract?

What is the elevation of this plain above the sea?

Where are the stĕppes, or desert parts?

How many chief water systems in Europe?

What forms the watershed between them?

Describe the basin of the Vŏl′ga.

Describe the basin of the Dăn′ube. The valley of the Po. The valley of the Rhōne.

Describe the river system of Spain.

What rivers in France besides the Rhōne?

Give a description of the Rhīne and its affluents.

By what rivers is the great plain of Europe traversed?

Chief rivers of Western and Northern Russia?

Extent of the water courses of England?

Which are the principal lowland lakes of Europe?

On which side of the crest of the Alps and Pȳr′enees are lakes most numerous?

Which is the most elevated of the Alpĭne lakes?
Describe Lake Genē′va.
In what country are Lakes Lucĕrne′, Briĕnz, and Cŏn′stance?
Where are lakes Cō′mo, Maggiō′re, Lugä′no, and Gär′da?
On what sea is the lowland of Germany?
What two peninsulas are connected with the Alps?
What volcanoes in Italy and its islands?
What mountainous peninsula in Northern Europe?
Are its mountains single or in ranges?
What large river rises in the Central Highlands and flows towards the east?
What two others in the Alps flowing north-west and south-west?
Which river flows from the southern declivity of the Alps?
In what ridge of land do most of the rivers of the north-eastern lowlands rise?
Into what seas do they flow?
Where are the Meūse′ and Schĕldt?
Where do the east and west branches of the Volga respectively rise?
What river of Asia flows from the U′ral Mountains?

CHAPTER IX.

SPECIAL GEOGRAPHY OF ASIA.

Preparatory Exercises on the Map of Asia.

291. How is Asia bounded?
What branches of the Arctic Ocean indent the north of Asia?
What branches of the Pacific in the east?
What islands skirt the Pacific coast?
What chain of islands extends from Kamtchăt′ka to Aliăs′ka?
What branches has the Chī′na Sea?
What branches of the In′dian Ocean indent the south?
Mention the branches of the Arā′bian Sea.
What is the entrance of the Red Sea?
How is Ceylōn′ separated from the main land?
How is Sumä′tra separated from the main land?
What strait between Sumä′tra and Jä′va?
How are Bornē′o and Cĕl′ebes separated?
What passage between Formō′sa and the main land?
What between the Japăn′ Isles and Corē′a?
What between the Saghä′lien Island and Mantchôô′ria?
Name the chief islands between Asia and Austrā′lia.
Where is the Island of Cȳ′prus?
Name the chief islands north of Asia.
What groups of islands in the Bay of Bengâl′?
What groups west and south-west of Hindostăn′?
What three great peninsulas in the south of Asia?
What is the southern cape of Hindostăn′?
What three capes of In′do-Chī′na?
What is the eastern cape of Arā′bia?
What peninsulas on the eastern coast of Asia?
What is their general direction from the coast?
How is Kamtchăt′ka bounded?
How is Corē′a bounded?
What is the southern point of Kamtchăt′ka?
What cape terminates Asia at Bēhr′ing's Straits?
Which is the most northern cape of Asia?
Which is the most southern cape?
How is Malaȳ′a connected with the main land?
What is the southern point of Ceylōn′?
Between what parallels is Asia?

Through what zones does it extend?
What country in Northern Asia?
What countries in Central Asia?
What three countries south of Toorkistăn′?
Which is the most western country of Asia?
What are the divisions of the Chīnese′ empire?
What are the divisions of In′do-Chī′na?
What island empire east of Asia?
What is the direction of the coast line of Hindostăn′?
How are these coasts distinguished?

§ 1. Extent and General Features of Asia.

292. The continent of Asia was the earliest inhabited by man; it is the largest, and in many respects the most interesting portion of the earth. The Arctic Ocean is on its northern border. On the north-east it approaches the American continent, from which it is separated by Bēhr′ing's Straits; On the east it is washed by the Pacific Ocean; south by the Indian Ocean; and on the west it is limited by Europe and Africa. It is separated from Africa by the Gulf of A′den, Strait of Babelmăn′deb, and the Red Sea, and is united to it by the Isthmus of Sŭ′ez. It is separated from Europe by the Mediterranean, the Arçhipĕl′ago, the Dardanĕlles′, the Mär′mora, the Bŏs′porus, the Black Sea, the crest of the Caucă′sian Mountains, the Căs′pian Sea, the U′ral River, and the U′ral chain of mountains to the Sea of Kä′ra. It lies between the parallels of 1° and 78° N. lat., and between the meridians of 26° E. and 168° W. lon. Its superficial area is estimated at 17,500,000 square miles, and its line of coast is 35,000 miles, or 500 square miles of surface to one mile of coast.

293. The body of Asia comprises the national divisions of Sibē′ria, Toorkistăn′, Chīnese′ Tartary, Chī′na, Tibet′, Afghanistăn′, Beloochistăn′, and Per′sia. On the south are the peninsulas of Arā′bia, Hindostăn′, and In′do-Chī′na; on the east Kamtchăt′ka and Corē′a; and on the west Asiatic Turkey. Asia is penetrated on its southern and eastern margins by several branches of the ocean. In the south are the Ara-

---

292. Asia. Asia compared with other continents. Boundaries. Waters between Asia and Africa. Isthmus uniting them. How separated from Europe? Extent. Area. Coast line. — 293. National divisions. Seas, gulfs,

bian Sea, Gulf of Omăn′, Pĕr′sian Gulf, Bay of Bengâl′, Gulf of Siăm′, Chī′na Sea, and Gulf of Tonkîn′; and in the east are the Yĕl′low Sea, Japăn′ Sea, and Okhŏtsk′ Sea. The surface of the continent presents a vast pile of highlands and plateaus, occupying the entire centre, with extensive broad and low plains on the north, and lowlands of less extent on the east and south.

§ 2. MOUNTAIN SYSTEMS OF ASIA.

294. The Asiatic portion of the great mountain zone of the old world comprises several important ranges. Tracing the highlands from the western limit of Asiatic Turkey, where the Balkăn′ system in Europe is interrupted by the Dardanĕlles′ and the Sea of Mär′mora, we find successively, in one general direction eastward, the Tâu′rus Mountains in Turkey, the Elbôôrz′ Mountains in Persia, and the Paropamî′san and Hĭn′doo-Koosh Mountains in Afghanistăn′, which extend as far as the Vale of Căshmere′. Here begins the Himalaȳ′a chain, taking a direction east-south-east to the 94th meridian, where the Brahmapôô′tra River intersects it; thence it bends east, running across Chī′na, to terminate in the Island of Formō′sa.

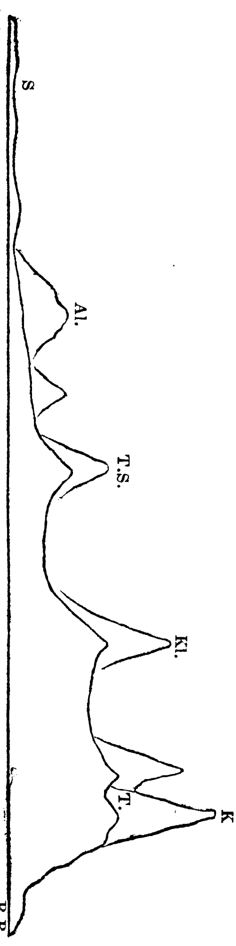
295. North of these ranges are the Altaī′ Mountains, commencing on the right bank of the Ir′tysh River, in about the 48th parallel of north latitude. They at first divide into three chains, forming a knot in the region of Lake Baī′kal, where its highest points rise to 10,000 feet. The principal chain continues on, in an irregular line, east-north-east, under the names of Yablŏn′noi and Stăn′novoi Mountains, to East Cape, at Bēhr′ing's Straits. The Altaī′ chain is a succession of terraces descending from the great central plateau, and ending in promontories on the Siberian plains.

296. The mean height of the Himalaȳ′a range is not less than 16,000 feet. In this system are found the loftiest summits in the world. The peak of Kunchingĭn′ga, on the north-west of Bootăn′, is 28,178 feet high — the highest yet ascertained. The Dhawalaghî′ri, situated on the border of Nepâul′, about 400 miles west of the former, is 28,080 feet

---

and bays on the south. East. Reliefs of the continent. — 294. The great mountain zone from the west of Asia Minor to the Vale of Cashmere. The Himalaya range. — 295. The Altai Mountains. Descent of the Altai chain from the central plateau. — 296. Mean height of the Himalaya range. Mount Kunchinginga. Dhawalaghiri. Region of the loftiest peaks of the Himalaya. —

high. All the highest peaks of this range are between the gorges of the Indus and Brahmapôô′tra Rivers.



Section of Asia from N. to S. along the 90th meridian.

A. O. — Arctic Ocean.
S. — Siberia.
Al. — Altai Mountains.
T. S. — Thian-Shan Mountains.

Kl. — Kuen-lun Mountains.
T. — Tibet.
K. — Kunchinginga Mountain.
B. B. — Bay of Bengal.

297. In the course of the Himalaȳ′a two remarkable *knots* occur. The *western knot* is north of Hindostăn′, where the Hĭn′doo Koosh meets the Himalaȳ′a, with the Belôôr′ chain branching off towards the north, and the Solymâun′ chain towards the south. The *eastern knot* is east of Bootăn′, where the Brahmapôô′tra cuts through the range. It is formed by a chain setting off towards the north-east, through Chinēse Tartary, and five chains towards the south, extending in a divergent direction through the Peninsula of In′do-Chī′-na, leaving large and fertile kingdoms between them. One of these, the West Siamēse′ ridge, is the longest, reaching to Cape Romă′nia, at the southern extremity of Malaȳ′a, and traceable through the Island of Sumä′tra.

298. The Kuĕn′-lŭn Mountains, north of the Himalaȳ′a, seem to be a continuation of the Hĭn′doo Koosh, pursuing an easterly direction. The Thī′an-Shăn′

---

297. Remarkable knots in this chain. Situation of the first knot. Situation of the second knot. The West Siamese ridge. — 298. Of the Kuen-lun Moun-

Mountains, north of the Kuĕn′-lŭn, extend east from the northern extremity of the Belôôr′ chain, along the 42d parallel of north latitude.

299. In Hindostăn′ the Western Ghâuts border the Malabär′ coast, at an elevation of 3000 feet, while the Eastern Ghâuts run along the Coromăn′del coast, forming a gradual descent from the table lands to the lowlands.

300. The Peninsula of Kamtchăt′ka is formed by a spur of the Altaī′ chain. It has a double row of active volcanoes on the eastern coast, some as high as 14,000 feet. Numerous islands extend from Kamtchăt′ka along the coast of Asia to the Malāy′ Peninsula, forming a volcanic band. They are generally long and narrow, and comprise the Kôô′rile Islands, Japăn′ Isles, Loo-Chôô′ Islands, Formō′sa, Philĭp′pine Islands, the Molŭc′cas, and Bornē′o.

301. The lofty range of the Caucā′sian Mountains, which extends for 700 miles between the Black and Căs′pian Seas, is an outlying member of the Asiatic highlands, and, like the U′ral, belongs in common to both Asia and Europe.

§ 3. Plateaus of Asia.

302. The table lands of Asia may be divided into two great portions — the Oriental plateau, or table land of Tibĕt′, and the plateau of Irăn, or table land of Persia.

303. The Oriental plateau is bounded on the south by the Himalaȳ′a Mountains, which separate it from the luxuriant plains of Hindostăn′; on the north by the Altaī′ Mountains, which separate it from the plains of Sibē′ria; on the west by the Belôôr′ Mountains, which separate it from Toorkistăn′; on the north-east by the Khingăn′ Mountains, which separate it from Mantchôu′ria; and on the south-east by mountain lands, which cover a great portion of Chī′na. This plateau has an area of 7,600,000 square miles, and a mean height of 14,000 feet. It is traversed from west to east by the Kuĕn′-lun and Thī′an-Shăn′ ranges.

304. The mountain valley of Tibĕt′ is enclosed between the Himalaȳ′a chain on the south and the Kuĕn′-lŭn on the north; Tungôôt′, or Chīnese′ Tartary, lies between the Kuĕn′-

---

tains. The Thian-Shan Mountains. — 299. The Western Ghauts. Eastern Ghauts. — 300. Peninsula of Kamtchatka. Islands along the eastern coast of Asia. — 301. The Caucasian Mountains. — 302. Division of the table lands of Asia. — 303. Limits of the Oriental plateau. Extent of its area. Mean height. Mountain ranges. — 304. Tibet. Tungoot. Mongolia. Breadth of this plalŭn and the Thî′an-Shăn, and Mongō′lia between the Thî′an-Shăn and the Altaī′ ranges. The breadth of the plateau on the west is from 700 to 1000 miles; on the east it is 2000 miles. In Little Tibĕt′ it attains an elevation of 12,000 feet, descending to 4000 towards its northern border.

305. The country of Tibĕt′, between the Himalaȳ′a and Kuĕn′-lŭn, consists of rocky, mountainous ridges, extending from north-west to south-east, separated by long valleys, in which flow the upper portions of the In′dus, Sŭt′ledge, and Brahmapôô′tra. The table lands of Chīnese′ Tartary, which lie beyond the Kuĕn′-lŭn Mountains, are less elevated and more fertile than Tibĕt′. Of Mongō′lia, between the Thî′an-Shăn′ and the Altaī′, little is known. Its grassy stĕppes are pasture grounds for the wandering Kîr′ghis of Tartary.

306. The remarkable feature of the Oriental plateau is the Desert of Cō′bi, or Shä′mo, which occupies 300,000 square miles in the eastern portion. The summer sun is scorching, and no rain falls; but in winter it is intensely cold, because the hills to the north are too low to screen them from the polar winds.

307. The plateau of Irăn′ is oblong, extending from the shores of Asia Minor to the Hĭn′doo-Kôôsh′ and the Solymâun′ Mountains. It covers an area of 1,700,000 square miles, generally about 4000 feet above the sea, and in some places 7000 feet. Anatō′lia, the most western part of this plateau, 3000 feet elevation, is traversed by short chains and broken groups of mountains, separated by fertile valleys. The Tâu′rus Mountains form the southern border. The table land becomes more elevated eastward, in Armē′nia and Koordistăn′. Mount Ar′arat is here, 17,212 feet high, with its summit shrouded in perpetual snow. The plateau of Irăn′ is bounded for 1000 miles, along the Persian Gulf and Sea of Arabia, by a mountainous belt, as far as the mouth of the In′dus, descending in terraces from the table land to the narrow shores of the gulf.

308. Excepting the provinces bordering on the Caspian Sea and in the Paropamî′san range, Persia is a desert country. A great salt desert occupies 27,000 square miles in the province of Khorassăn′, and south of it is the large sandy desert of Kirmăn′. The greater part of Beloochistăn′ is a lifeless plain, over which the red sand is drifted by the

---

teau. Elevation in Tibet. — 305. The country of Tibet. Table lands beyond the Kuen-lun Mountains. Of Mongolia. — 306. Desert of Cobi. — 307. The plateau of Iran. Of Anatolia. Mount Ararat. Boundary of this plateau along the Persian Gulf and Arabian Sea. — 308. Persia a desert. Beloochistan, north wind into ridges often 12 feet high. In Afghanistăn′ there is little cultivation, except on the banks of rivers; but towards the north-east the plains and valleys among the offsets of the Hĭn′doo-Kôôsh′ are of surprising loveliness and beauty.

§ 4. Declivities and Plains of Asia.

309. All the country north and east of the Căs′pian Sea, and between the U′ral and Altaī′ mountains, presents a dead level of thin but luxuriant pasture, called the Kîr′ghis stĕppes. Immense herds of cattle, horses, and camels roam over them while covered with verdure, but in winter they become trackless fields of snow.

310. Sibē′ria is either a dead level, or an undulating surface of more than 7,000,000 square miles, commencing at the base of the Altaī′ Mountains and descending towards the Arctic Ocean. It is chiefly composed of vast stĕppes, some fertile, some desert, and others marshy, and is traversed by numerous rivers, many of whose valleys are fertile. Some of the southern regions produce grain and grass. The lowlands, lying south of the great mountain zone, are much broken by its offsets, by separate groups of mountains, and by deep indentations of bays and large seas. The country of Mantchôu′ria, lying immediately south of the Yablŏn′noi Mountains, is similar in aspect to Sibē′ria. It is partly intersected by mountains and covered by dense forests. Towards Corē′a the country is more fertile.

311. Chī′na is the most productive country on the face of the earth. Its eastern part is an alluvial plain of 200,000 square miles. The greater part of the plain is occupied by rice and garden grounds. The tea plant grows on a low range of hills between the 30th and 32d parallels of latitude.

312. The In′do-Chīnese′ Peninsula has an area of 77,700 square miles, and projects 1500 miles into the ocean. Extensive plains lie between the offsets descending from the east end of the Himalaȳ′a. Magnificent rivers intersect these plains, whose soil they have brought down from the table land of Tibĕt′.

313. The plains of Hindostăn′ extend 2000 miles along the

Afghanistan. — 309. Country north and east of the Caspian Sea. Summer and winter. — 310. Of Siberia. Chiefly what? Lowlands south of the mountain zone. Mantchouria. — 311. China. The tea plant. — 312. The Peninsula of Indo-China. — 313. Plains of Hindostan. Valley of the Ganges. — 314. The southern slopes of the Himalaȳ′a, between the Brahmapôô′tra and the In′dus, and terminate on the south in the Bay of Bengâl′, the table land of the Dĕc′can, and the Arā′bian Sea. The valley of the Gan′ges is one of the richest on the globe, and is under a high state of cultivation. The ascent of the plain of the Gan′ges from the Bay of Bengâl′ is so gradual, that Serampōre′, nearly at the foot of the Himalaȳ′a, is only 1100 feet higher than Calcŭt′ta.

314. The Peninsula of Hindostăn′ is occupied by the triangular-shaped table land of the Dĕc′can, which is much lower, and wholly separate from the plateau of Tibĕt′. It has the ranges of the Ghâuts on the west and east, and the Vînd′hya and Sautpôô′ra ridges on the north. Its surface, which has an elevation of 3000 to 4000 feet, is a combination of plains, ridges of rocks, and insulated flat-topped hills. The peninsula terminates with the table land of Mysōre′, 7000 feet above the sea, surrounded by the Blue Mountains, which rise 3000 feet higher. The western or Malabär′ coast is rocky, but in many parts well cultivated, and its mountains covered with forests. On the eastern or Coramăn′del coast, the mountains are bare and lower, and the wide plains are generally parched. The Island of Ceylōn′ is almost joined to the main land by sand banks and small islands, between which the water is at times quite shallow. It has a rich and fertile soil, lofty mountains, numerous streams, and native forests.

315. Another range of table lands extends from the southern border of Koordistăn′, through Syria, gradually spreading as it proceeds south, until it fills the Peninsula of Arā′bia. The northern part is the Syrian plateau, and the southern is the Arabian plateau. The plateau of Syria descends gradually towards the Syrian desert on the east. It is crossed by mountains, and is divided by a remarkable chasm which extends from the Tâu′rus Mountains to the Gulf of Ak′aba, the eastern arm of the Red Sea. The northern part of this chasm, or valley, contains the River Jör′dan, Lake of Tibē′rias, and Dead Sea. At the Lake of Tibē′rias it is 329 feet below the Mediterranean, and at the Dead Sea the depression is 1312 feet. The southern portion of the Syrian plateau contains the mountain land of Palestine, with the lowland coast of Philis′tia. It is divided into Găl′ilee in the north, Sama′ria in the centre, and Judea in the south. Between

---

Deccan. Its limits. Surface. Mysore. Malabar coast. Coromandel coast. Ceylon. — 315. Plateaus of Syria and Arabia. Describe the plateau of Syria. Remarkable chasm. Lake of Tiberias and Dead Sea. Palestine. Its divisthe Gulfs of Ak′aba and Sū′ez the mountain group of Sī′nai is situated.

316. The Arabian plateau is separated from the Syrian by the Ramlē′ah Mountains. The interior appears to be a genuine table land traversed by mountains, but forming one great desert, without trees or rivers, or scarcely any vegetation. The south-west portion is called Arabia Felix, or "The Happy," on account of its fertility. The narrow lowlands which border the table lands of Arabia and Persia are intensely hot.

§ 5. River Systems of Asia.

317. Asia contains many large river systems. The only one of importance in Western Asia is that of the Euphrā′tes and Tī′gris. Its basin comprises an area of 230,000 square miles. The Euphrā′tes rises in two sources, one in the interior of Armē′nia not far from Mount Ar′arat, the other in the mountains of Erzrôôm′, on the table land. The whole river then descends in rapids through the Tâu′rus Mountains south-easterly across the plains of Mesopotā′mia. The Tī′gris has its principal source in the mountains of Armē′nia, and west of Lake Van. Its first course is rapid, but in the plains its current is slow. Near to the city of Băg′dad, the Tī′gris and Euphrā′tes approach to within 12 miles of each other, and from this point they run nearly parallel for more than 100 miles. They unite above Bassō′rah, and form one stream, which flows into the Persian Gulf. In the plains of Mesopotā′mia are the sites of the ancient cities of Nĭn′eveh and Băb′ylon.

318. From the southern side of the Oriental plateau and its mountain barriers, a great system of rivers descends, comprising six rivers of the first magnitude, besides many others, and conveying to the ocean a greater volume of water than all the remaining rivers of the continent. They are the Indus, the Găn′ges, the Brahmapôô′tra, the Irrawä′dy, the Menăm′, and the Cambō′dia.

319. The Indus River has its origin on the northern declivity of the Himalaȳ′a, not far from Lake Măn′sarowâr′, and taking a W. N. W. course, runs through the valley

---

ions. Sinai. — 316. Arabian plateau. Arabia Felix. — 317. Chief river system in Western Asia. Describe the Euphrates. The Tigris. Union of the Euphrates and Tigris. Sites of ancient cities. — 318. River systems south of the Oriental plateau. Names of the six largest rivers. — 319. Describe the Indus.

of little Tibĕt′, and, intersecting the great Himalaȳ′a chain in about 35° N. lat., and 74° E. lon., west of the Valley of Cashmēre′, it descends south-west to the plains of the Punjâb′. The Sŭt′ledge, the chief tributary of the Indus from the east, springs from the sacred lakes in the Valley of Tibĕt′, and flows westward along the valley. At about 75° E. lon. it also breaks through the Himalaȳ′a Mountains, descends south-west to the plains of the Punjâb′, and, after receiving several large streams, it joins the Indus above Mittŭn′. The Plains of the Punjâb′, so called from being watered by "the five rivers," is one of the most valuable countries in the East. From Mittŭn′ the Indus flows on southerly, and empties into the Sea of Arabia by several mouths. Its length is 1650 miles, and it drains an area of 400,000 square miles.

320. The Găn′ges and Brahmapôô′tra form a double system. They rise on opposite sides of the Himalaȳ′a, not far from each other, but each has its own basin, and flows through the greater part of its course independent of the other.

321. The Găn′ges flows at once in a very rapid stream, 120 feet wide, from a perpendicular wall of ice, about 200 miles N. N. W. of Dĕl′hi, and at an elevation of 13,800 feet above the sea. Many streams from the southern slope of the Himalaȳ′a unite at Hurdwâr′ to form the great body of the Găn′ges. It flows on in a south-easterly course through the plains of Bengâl′, receiving on its way 20 tributaries of considerable size. About 220 miles from the Bay of Bengâl′, into which the Găn′ges flows, it divides into many channels and branches, forming an intricate maze over a large delta.

322. The Brahmapôô′tra rises near the sources of the Sŭt′ledge and In′dus, in about 30° N. lat., and 82° E. lon. It flows easterly under the name of Sanpôô′, through the great valley of Eastern Tibĕt′, till it reaches the 90th meridian, where it makes a sudden bend to the south, cutting through the Himalaȳ′a chain, and enters Upper Assăm′. Here it is first called the Brahmapôô′tra, the "Offspring of Brăh′ma;" and taking a south-westerly course, it enters the plains of Bengâl′, where branches of it unite with those of the Găn′ges, about 40 miles from the coast. The two rivers enter the Bay of Bengâl′ by different channels. The length of the Brahmapôô′tra is estimated at 1500 miles. The basins of these two great rivers contain an area of 650,000 square miles.

323. The river system of the INDO-CHINESE PENINSULA

Describe the Sutledge. Plains of the Punjab. The Indus below Mittun. — 320. The Ganges and Brahmapootra. — 321. Source of the Ganges. Union of streams at Hurdwar. Course. Division 220 miles from the Bay of Bengal. — 322. Brahmapootra from its source to the gorge in the Himalaya Mountains.

comprises several large rivers flowing through the great valleys that extend from the north to the south, with singular uniformity, between the chains of mountains which are no less uniform, and spreading out like a fan as they approach the sea. The three largest rivers are the Irrawä′dy, which waters the Bĭr′man empire, and falls into the Bay of Bengâl′; the Menăm′, or River of Siăm′; and the Cambō′dia, in the east of Annăm′; the last two falling into the Gulf of Siăm′ and the Chī′na Sea. All the rivers of this part of Asia are subject to periodical inundations, which fertilize the plains at the expense of the mountains.

324. Four great river systems take their origin on the Eastern Declivity of the great central plateau of Asia, and, running from west to east, traverse the Chinese empire. The Hoăng-Kiăng′ rises in the province of Yunnăn′, and flows east through the plains of Cantŏn′ into the Bay of Cantŏn′. The Yăng′-tse-kiăng′, or "Son of the Ocean," and the Hoăng′-ho, or "Yĕl′low River," are of the first magnitude. Though near in their sources and in their termination, each is compelled to describe an immense circuit, with an interval of more than a thousand miles — the Yăng′-tse-kiăng′ towards the south, nearing the tropical regions — the Hoăng′-ho towards the north. They then bend, the one south-east, and the other north-east, approaching each other, and enter the Yĕl′low Sea not more than 100 miles apart. They are united in the lower part of their course by many canals, thus forming one of the grandest systems of internal navigation and irrigation in the world. The Amôôr′ or "Great River," rises in Sibē′ria, near Lake Baī′kal, and flows in an irregular course eastward, through the Mantchôu′rian territory, into the channel of Tartary, opposite the Island of Saghä′lien. It is 2000 miles long, and has a basin of 853,000 square miles.

325. The Northern Declivity of Asia is characterized by *three great river systems* — the Lē′na, the Yenisê′i, and the double system of the O′bi and Ir′tysh. The Lē′na flows from the mountains north of Lake Baī′kal, and runs north-east through more than half its course to the town of Yakôôtsk′ in 66° N. lat., (*the coldest town on the face of the earth;*) thence north to the Arctic Ocean. Its length is 1900 miles, and its basin is 800,000 square miles. The Yenisê′i is much larger than the Lena, with a basin of about 1,000,000 square miles. It is formed by several streams which flow from the

---

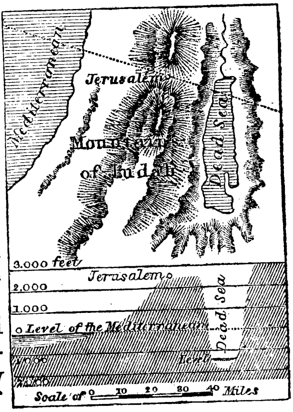
Name. Course. Junction with the Ganges. Their basins. — 323. River system of Indo-China. Three largest rivers. Remark on the rivers in this part of Asia. — 324. River systems of Eastern Asia. The Hoang-Kiang. Yang-tse-Kiang, and Hoang-Ho. Amoor. — 325. River systems of Northern Asia.

highlands west of Baĭ′kal, and, taking a northern direction, empties into the Arctic Ocean, after a course of 2500 miles. The O′bi is formed by the rivers which flow from the northern declivity of the Little Altaĭ′ Mountains; and the Ir′tysh by those from the south-western side. The O′bi is 2000 miles long; and the basin of these two streams occupies a third part of Sibē′ria. All the Sibē′rian rivers are frozen annually for many months, and the ocean along the coasts is rarely free from ice.

§ 6. Lakes of Asia.

326. The Lake of Tibē′rias and the Dead Sea, in Syria, are situated in the deepest cavity on the earth. The surface of Tibē′rias is 329 feet below the level of the Mediterranean, and surrounded by verdant plains, while the Dead Sea is 1312 feet below the same level, presenting a scene of desolation and solitude, encompassed by desert sands, and bleak, stony salt hills. The difference of level between these two lakes is 983 feet in little more than 60 miles, which gives the course of the Jordan a rapid current. The water of the Dead Sea is very salt and bitter.

327. The characteristic feature of Asia Minor, and of all the table land of Western Asia, and the neighboring stěppes, is the number and magnitude of the salt lakes. These lakes are fed by springs, rain, and melted snow; and having no outlets, the surplus water is carried off by evaporation. The soil of the table land is volcanic, which may account for the saltness of the waters.



328. Lake Van, in Turkey, and Lake Ooroomēē′a, in Persia, are separated only by a low range of hills. Their waters are salt, and they are about 240 miles in circumference. Persia is remarkably destitute of water. The Lake of

---

The Lena. Yenisei. Obi. Remark on the Siberian rivers. — 326. Locality of the Lake of Tiberias and Dead Sea. Special remark on Lake Tiberias. On the Dead Sea. Their difference of level. Water of the Dead Sea. — 327. Characteristic feature of the table lands of Western Asia. Supply and waste of the waters. Soil. — 328. Lake Van, and Lake Ooroomeea. Waters of Per-

Zŭr′rah, on the frontiers of Afghanistăn′, is the only sheet of water on the western part of the table land of Irăn′.

329. The Căs′pian, usually termed a sea, is the largest salt lake in the world. Its surface is 83 feet below the level of the ocean, and is from 120 to 350 miles wide, and 760 miles long from north to south. It is surrounded by Tartary, Persia, and Caucă′sian countries, and the Rŭs′sian governments of Astracăn′ and O′renboorg. It receives the waters of the Vŏl′ga, the U′ral, and other great rivers on the north, but has no outlet.

330. Lake A′ral lies east of the Căs′pian, and its surface is 118 feet higher. It is nearly 300 miles long, and 150 miles wide. Its waters are less salt than the Căs′pian, and it is so shallow that none but flatboats are used in its navigation. It has no outlet.

331. The small number of lakes in the Himalaȳ′a is one of the peculiarities of these mountains. Lake Wôô′ler, in the Valley of Cashmēre′, is the only one of any magnitude. On the table lands there are many lakes, both fresh and salt. Lake Pâl′teh is very remarkable on account of its form, being that of a ring. It is situated at the northern foot of the Himalaȳ′a, about 60 miles south of Lăs′sa.

332. The sacred lakes of Mănsarowâr′ and Rä′kas-Täl, in Great Tibĕt′, occupy a space of about 400 square miles north of the Himalaȳ′a, in 31° N. lat., and 81° E. lon., and they mark the point from around which all the great rivers rising in the Himalaȳ′a have their origin. These lakes have an elevation of 15,200 feet above the level of the sea. The Tĕn′gri-Nor, in Tibĕt′, the Kō′ko-Nor and Lŏp-Nor, in Chinese Tartary, are all large lakes.

333. The lakes in the Altaī′ range are beautiful, larger, and more numerous than in any other mountain chain. They are situated at different elevations on the terraces by which the table lands descend to the plains of Sibē′ria. Lake Baī′kal is the largest, having an area of 14,800 square miles, and an elevation of 1535 feet. It lies amidst lofty granite mountains, receiving many streams from its basin, and has for its principal outlet the River Angarä′, which, though very rapid, is said to carry off but a tenth part of its mass of waters.

---

sia. Lake of Zurrah. — 329. The Caspian Sea. — 330. Lake Aral. — 331. Peculiarity of the Himalaya Mountains. Lake Palteh. — 332. The sacred lakes Lakes of Chinese Tartary. — 333. Lakes of the Altai Mountains. Lake

§ 7. Geology of Asia.

334. The crest of the Himalaȳ'a is of stratified crystalline rocks, especially gneiss, with large granite veins, and beds of quartz of huge magnitude. The zone, between 15,000 and 18,000 feet above the level of the sea, is formed chiefly of paleozō'ic strāta. Granite is most frequent at the base, and probably forms the foundation of the chain. Strāta of ō'olites occur at great elevations. In the Yablŏn'noi range, and in other parts, there are whole mountains of pör'phyry, with red and green jăs'per. Coal is also found. The Sibē'rian mountains far surpass the Andes in the richness of their gold mines. Rocks of the paleozō'ic series occupy the greater part of the Altaī'. There are no volcanic rocks west of the Yenisê'i, but they abound to the east of that river, even to Kamtchât'ka.

Table of Minerals of Asia.

Diamonds. — India and Siberia.
Other Precious Stones. — Birmah, Siam', India, Chinese empire, Persia, Siberia, and Toorkistan.
Gold. — Japan, Chinese empire, Siberia, Birmah, Anam', Siam', Malay'a, Assam', &c.
Silver. — China, Russia, Japan, Asia Minor.
Tin. — Birmah, Siam', Malay'a, China, and Anam'.
Mercury. — China, Tibet', Japan, India, and Ceylon.
Copper. — Japan, Siberia, Asia Minor, Anam', India, and Persia.
Iron. — Siberia, India, China, Siam', Anam', Asia Minor, Afghanistan', Persia, and Japan.
Lead. — China, Siberia, Siam', Japan, Persia, Arabia, Asia Minor.
Coal. — Chinese empire, Turkey, India, Japan.
Salt. — Chinese empire, India, Siberia, Turkey, Persia, and Arabia.

Baikal. — 334. Geology. Crest of the Himalaya. 15,000 feet elevation. Base. Oolites. Yablonnoi range. Siberian Mountains. Altai Mountains.

§ 8. Questions for Review.

335. What is a prominent feature in the reliefs of the Asiatic continent?

Into what two portions may the table lands of Asia be divided?

By what name is the western portion known? By what the eastern?

What highlands bound the Oriental plateau on the south? What on the north?

What extent of area has the Oriental plateau? Its mean elevation?

What two mountain chains traverse it from west to east?

What three sections of country are thus formed in the Oriental plateau?

What desert occupies the eastern portion of this plateau?

What are the limits of the plateau of Irăn′?

What is its area? Its elevation?

What mountain summit renowned in history on this plateau?

What marks the descent from this plateau on the south?

What two desert spots in the plateau of Irăn′?

What countries does this plateau include?

By what are these countries characterized?

What is the aspect of the country lying north of the central table lands of Asia?

What contrast is presented by those countries south of the Himalay′a Mountains?

What is the mean height of the Himalay′a range?

What rank does this range hold among the mountain systems of the world?

Name the principal summits of the Himalay′a.

Which is the chief, and how high is it?

What two remarkable gorges in this chain of mountains?

What two remarkable mountain knots?

What four chains radiate from the western knot?

What chains radiate from the eastern knot?

What are the physical aspects of Hindostăn′?

What remarkable features mark the In′do-Chinēse Peninsula?

Describe the Caucă′sian Mountains.

Where is Kamtchăt′ka, and what is its character?

What islands extend from Kamtchăt′ka along the coast as far as Malay′a Peninsula?

What is the nature of these islands?

What is the character of Mantchôô′ria?

What lowlands lie between the base of the Himalaȳ′a and the Dĕc′can?

Describe the Syrian plateau.

Describe the Arabian plateau.

What river system in Western Asia?

What six important rivers flow from the southern side of the Oriental plateau?

Describe the course of the Indus.

Describe the course of the Brahmapôô′tra. The Găn′ges.

What does the river system of In′do-Chī′na comprise?

What four rivers take their origin on the eastern declivity of the Oriental plateau?

What three river systems characterize the northern declivity?

What is the character of the lakes of Western Asia?

Describe the Căs′pian Lake.

Describe Lake A′ral. The lakes of Palestine.

Where is Lake Wôô′ler?

What singular fact concerns Lake Pâl′teh?

What and where are the sacred lakes? Principal lakes in Chinēse′ Tartary?

Describe Lake Baī′kal.

What inland bodies of water in Europe, Africa, and Asia lie between the 10th and 50th parallels of north latitude?

What important river west of the Red Sea?

What two rivers north-east of the Red Sea?

What rivers of Asia lie north-east of these inland seas?

What is a remarkable feature in the southern and eastern coast line of Asia?

CHAPTER X.

SPECIAL GEOGRAPHY OF AFRICA.

PREPARATORY EXERCISES ON THE MAP OF AFRICA.

336. How is Africa bounded?
What branches of the Atlantic indent the western coast?
What branches of the Mediterranean in the north?
What branches of the Gulf of Guĭn'ea in the west?
What branches of the In'dian Ocean in the east?
What passage of water from the Gulf of A'den to the Red Sea?
What passage separates Madagăs'car from Africa?
How is Africa connected with Asia?
What islands along the east coast of Africa?
What noted groups of islands west and north-west of Africa?
Which is the most northern cape? Eastern?
Which is the most southern cape? Western?
What cape north of Morŏc'co?
What capes between Cape Verd and Cape Spär'tel?
What between Cape Verd and Gulf of Biăf'ra?
What between Gulf of Biăf'ra and Cape Agul'has?
What between Cape Agul'has and Cape Guardafuì'?
Where are Capes Am'ber and St. Mary?
What important islands lie east of Madagăs'car?
What two pelăg'ic islands west of Lower Guĭn'ea?
What great circle crosses Africa?
On which side of it is the greater part of Africa?
What other circles cross Africa? Where?
Between what parallels does Africa extend?
Between what meridians?
What countries border on the Mediterranean?
What on the Red Sea?
What on the Indian Ocean?
What at the southern extremity of Africa?
What on the Atlantic, between Sahä'ra and Cape Colony?
What region extends eastward from Senegăm'bia to Abyssĭn'ia?
How is the Sahä'ra Desert bounded?
What is the northern limit of the negro races?
What republic in the west of Africa?
What are the latitude and longitude of the Island of St. Hele'na?
Between what meridians does the Nile hold its course?

What section of the United States corresponds in latitude with the Barbary States?

What part of the American continent corresponds with the Sahä′ra Desert in latitude?

What circle intersects the desert from east to west?

---

§ 1. Extent and General Features of Africa.

337. Africa, one of the three southern continents, is next to Asia in extent of surface. It is a solid mass of land, with a somewhat regular line of coast, unbroken by any large peninsulas, bays, or gulfs, excepting in the wide and deep indentation on the south-west side. It is bounded on the north by the Mediterranean Sea and Straits of Gibrâl′tar; east by the Red Sea, Straits of Babelmăn′deb, Gulf of A′den, and Indian Ocean; south by the Southern Ocean; and west by the Atlantic. It extends from 37° 07′ N. to 34° 51′ S. lat., and from 17° 34′ W. to 51° 21′ E. lon. Its surface is estimated at 11,870,000 square miles, and its coast line is 16,000 miles, or 1 to every 741 square miles of surface.

338. In the north are the Barbary States and Sahä′ra Desert; Egypt, Nū′bia, and Abyssĭn′ia occupy the north-east; along the southern border of the desert lie the countries of Soodăn′, Senegăm′bia, Libē′ria, and Upper Guĭn′ea; on the borders of the Indian Ocean are A′jan, Zanguebär′, Mozambîque′, Sofä′la, and Căf′ferland; at the southern extremity is the Cape Colony; and along the South Atlantic coast are Loăn′go, Cŏn′go, Angō′la, and Benguē′la. The interior of Southern Africa is an unexplored country.

339. The largest indentation of the coast is that formed by the Gulf of Guĭn′ea, on the south-west, from which two branches extend more inland — the Gulfs of Benîn′ and Biăf′ra. On the north are the Gulfs of Cābes and Sī′dra, branches of the Mediterranean Sea. Marŏc′co and Tū′nis are the most northerly projections, while A′jan and Cape Guardafuî′ form the eastern point.

340. Africa, with the exception of the mountainous region of the Atlas and the small table land of Bär′ca, may be said

---

337. Africa. General features of Africa. Boundaries. Extent. Area. Coast line. — 338. National divisions. — 339. Gulfs on the west. Indentations and projections on the north and east. — 340. Reliefs of Africa. Plateau of

to consist of only two parts, a high and a low country. In place of mountain chains enclosing central plains, it has a vast central plateau occupying the southern half of the continent, with two branches in the highlands of Soodăn′ and Abyssĭn′ia. This plateau has narrow lowlands on the coast, and descends on the north into the desert plains of Northern Africa, limited by the independent table lands of Barbary and Bär′ca.

§ 2. MOUNTAIN SYSTEMS OF AFRICA.

341. The Atlas and Spanish mountains form the western extremity of the great zone of high land that girds the Old World. Along the north-west of Africa, the elevated Atlas system extends in a broad belt from the Atlantic to the Gulf of Sī′dra, in the Mediterranean, enclosing all the highlands of Marŏc′co, Algē′ria, and Tū′nis. This system consists of three parts — the Great, the Little, and the Middle Atlas.

342. The Great Atlas chain is farthest inland, extending from Cape Bojadōr′ on the Atlantic, in a north-east direction, forming in Marŏc′co a mountain knot of 11,400 feet elevation, with abrupt precipices. The Little Atlas begins at Cape Spär′tel, opposite Gibrâl′tar, and runs parallel to the Mediterranean as far as Cape Bŏn, the northern point of Tū′nis. The Middle Atlas, lying between the two former chains, consists of a table land rich in valleys, rivers, and magnificent forests, with a delightful climate.

343. The table land of Bär′ca is a small, detached plateau, rising precipitously from the sea, and forming a level fertile district of about 1500 feet elevation, and descending gradually towards the desert.

344. A mountain range, commencing with Table Mountain, 3582 feet high, at the Cape of Good Hope, skirts the southern and eastern coasts of Africa, and terminates in the vast promontory of Abyssĭn′ia. This range appears in three principal sections — the Snow Mountains in Cape Colony and Căf′ferland; the Lupä′ta Mountains in Mozambîque′; and the Mountains of the Moon, or Kŏm′ri chain, commencing in Zanguebär′ at about 8° S. lat.

345. The Mountains of the Moon attain their greatest elevation between the third and fourth parallels of south

---

the south. Lowlands on the coast and in the north. — 341. The Atlas and Spanish mountains. The Atlas system of mountains. Three parts. — 342. Great Atlas. Little Atlas. Middle Atlas. — 343. Table land of Barca. -

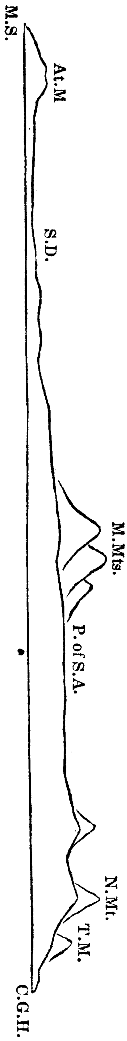
latitude, and are the highest in Africa. The peak of Kilimanjaro, three degrees south of the equator, in the country of Mō′no-Moē′zi, rises to an elevation of 20,000 feet. It is supposed by some geographers that the River Nile has its highest source in this vicinity.

346. Abyssinia is crossed by two ranges of mountains — that of Gō′jam on the west, and of Sä′men in the centre. The Kong Mountains are situated in the western part of Africa, having Soodăn′ on the north, Senegăm′bia on the west, and Guĭn′ea on the south. In the western portion the elevation is about 3000 feet. The Cameroōns′ Mountains, near the coast of Biăf′ra, rise to an elevation of 13,000 feet, and are of volcanic formation.

§ 3. Plateaus of Africa.

347. Southern Africa is an extensive table land, reaching from the Atlantic to the Indian Ocean, and from the Cape of Good Hope to the plains of Soodăn′, north of the equator. On three sides it descends in narrow parallel terraces, separated by mountain ridges, and decreasing in height as they approach the ocean. The structure of the northern declivity is believed to be similar, though only its eastern and western extremities are known. Very little is known of the interior of this plateau.

348. The promontory of Abyssĭn′ia projects from the table land for 300 miles into the lowlands of North Africa. It dips to a low, swampy region on the north, to the plains of Sennäar′



Section of Africa along the 20th meridian.

M. S. — Mediterranean Sea.
At. M. — Atlas Mountains.
S. D. — Sahara Desert.
M. Mts. — Moon Mountains.
P. of S. A. — Plateau of Southern Africa.
N. Mt. — Nieuweveld Mountain.
T. M. — Table Mountain.
C. G. H. — Cape of Good Hope.

---

344. Mountain range of Southern and Eastern Africa. Three sections. — 345. Mountains of the Moon. Peak of Kilimanjaro. Source of the Nile River. — 346. Mountains in Abyssinia. Kong Mountains. Cameroons Mountains. —

and Kordofăn′ on the west, and on the east, from the plateau of Tī′gre, an elevation of 9000 feet, it sinks abruptly to the coast at a short distance from the Red Sea. The table land of Abyssĭn′ia is a succession of undulating plains, broken by mountain masses, which, in the south, attain a height of about 13,500 feet. These plains are intersected by numerous tributaries to the Nile. This elevated country has lakes, swamps, verdant meadows, and cultivated fields.

§4. Declivities and Plains of Africa.

349. The waters that descend from the northern declivity of the South African plateau fertilize a tract of country stretching from sea to sea across the continent, forming the commencement of the African lowlands. This is Soodăn′, comprising many kingdoms and commercial cities, and containing large lakes, poisonous swamps, deep forests of gigantic trees, and vast solitudes. It is narrow, compared with its length. At about 15° N. lat., which is the northern limit of the negro races, the moisture becomes less, and the soil gradually worse, till at length the barren waste of the Great Sahä′ra begins.

350. The vast Desert of Sahä′ra is bounded on the north by the Barbary States and Mediterranean Sea; east by the Valley of the Nile; south by Soodăn′ and the countries watered by the Senegâl′ River, and west by the Atlantic. Its breadth varies from 700 to 1500 miles, and the length is nearly 3000 miles from east to west, which is even prolonged for miles into the Atlantic Ocean, in the form of sand banks. At the Great Sȳr′tis, or Gulf of Sī′dra, the desert reaches the shores of the Mediterranean. The surface of the desert appears to be composed chiefly of sandstone and loose sand. Every part is almost entirely destitute of vegetation. On the eastern and northern borders fresh water rises near the surface, and produces an occasional ō′asis, or fertile spot in the midst of barrenness. These ō′ases are generally depressed below the level of the desert; the smaller ones producing herbage, ferns, acacias, and some shrubs — the larger containing forests of date palms. The western part is a low region of burning sands, moving in waves like the sea. The wind blows from the east nine months in the year, and at the

---

347. Plateau of Southern Africa. Descents from the plateau. The northern declivity. — 348. Promontory of Abyssinia. Its descents. Table land of Abyssinia. — 349. The country of Soodan. Northern limit of the negro races. — 350.

equinoxes, in March and September, it rushes in a hurricane, driving the sand in clouds before it. In this section the ō′ases are rare.

351. East of the Sahä′ra are the Nū′bian and Lĭb′yan Deserts, where the continent descends towards the Mediterranean, in terraces of sandy or gravelly deserts, separated by rocky ridges. This tract, which comprises Egypt and Nū′bia, is flanked by rocky eminences running from the table land towards the north, and is cut transversely by the Nile, and by a deep furrow parallel to it, in which there is a long line of ō′ases.

352. The plains of Zanguebär′ and Mozambîque′ are fertile in palm trees and great quantities of grain, and noble forests cover the mountains; but the eastern coast, from Cape Guardafuî′ to 4° N. lat., is a continued desert. Another barren tract succeeds at the southern extremity of the Lupä′ta Mountains.

353. The lowland of Cape Colony is a fertile, well-watered plain, richly adorned with grass and trees, and having a mild and agreeable climate. The country here, as also along the western coast, descends from the table land in successive terraces. The low plains of Biăf′ra and Benîn′ consist entirely of swamps loaded with rank vegetation.

§ 5. River Systems of Africa.

354. The tropical climate, and the extremes of the dry and rainy seasons, give a marked peculiarity to the river systems of Africa.

355. The Nile, on account of its comparative magnitude and historical interest, takes the first rank. Two large rivers unite in the plains of Sennäar′ at Khartôom′ to form the Nile — the Bähr-ĕl-A′biad, or White Nile, and the Bähr-ĕl-Az′rek, or Blue Nile.

356. The White Nile is supposed, by some, to rise in Mount Kilimanjaro, south of the equator, and by others still farther south, in Lake Marä′vi; and amidst many windings, receiving many affluents, takes a general direction towards the north.

357. The Blue Nile, rising in the Găl′la country, south of

Sahara Desert. Boundaries. Extent. Surface. Oases. Western part of the desert. — 351. Nubian and Libyan Deserts. Countries occupying this tract. — 352. Eastern coast of Africa. — 353. Lowland of Cape Colony. Plains of Biafra and Benin. — 354. Remark on the waters of Africa. — 355. The Nile. Its sources. — 356. The White Nile. — 357. The Blue Nile. Point of confluence.

Abyssĭn′ia, receives in its north-westerly course many tributaries, of which the Abai′ is the largest. The Blue Nile joins the White in 15° 40′ N. lat., and 32° 30′ E. lon. At some distance below their confluence, the River Tacăz′ze flows into the Nile; and from this point down to the Mediterranean, a distance of 1200 miles, the Nile does not receive a single brook.

358. The Nile, soon after it receives the Tacăz′ze, makes a remarkable bend to the west and south, and again to the north, called the Great Bend of the Nile. In its course through the Nū′bian Desert, it forms several cataracts, the last of which is at Assouân′, where it enters Egypt. At 90 miles from the sea, the Nile is divided into two heads. One, running north-west, enters the Mediterranean below Rosĕt′ta; the other, north-east, enters the sea at Damiĕt′ta, so that the Dĕl′ta, between them, has a sea coast of 187 miles.

359. The basin of the Nile is wide in Ethiō′pia and Nū′bia; but for the greater part of its winding course of nearly 3000 miles, it is merely "a verdant line of the softest beauty," suddenly and strongly contrasted with the dreary waste of the desert. From the great elevation of its sources, the upper part enjoys a perpetual spring, though passing under the equator. At the foot of the table land of Abyssĭn′ia the country is covered with dense jungles, while the rest of the valley is the rich soil brought down by the Nile from the mountains.

360. Egypt is wholly dependent upon the Nile for its fertility. Without the moistening influence and the periodical deposits of sediment from this river, the Sahä′ra would extend to the Red Sea. The rise of the river, which is caused by the heavy annual rains within the tropics, commences about the month of June, attains its height in September, and, after remaining stationary for some days, gradually subsides until the last of December, when it is very low. The surface of the land, having thus received a fresh layer of mud, is put under cultivation. The extent of inundation in Upper Egypt is comparatively small; but in Lower Egypt it overspreads most of the Delta and the adjacent plains. A rise sufficient to fertilize the whole country is from 25 to 28 feet.

361. The River Nī′ger (Nī′jer), or Quor′ra, and in its

Tributary below their confluence.— 358. Course below the Tacazze. Cataracts. Mouths of the Nile. The Delta.— 359. Basin of the Nile. Aspects of the upper, middle, and lower portions of the basin. — 360. Influence of this river upon Egypt. Rise of the Nile. Extent of inundation.— 361. The Niger. Source.

upper portion called the Jŏl′iba, is the second great river of Africa. It rises on the northern slope of the Kŏng Mountains, in the Bambăr′ra country, and taking a north-easterly direction on the high table lands of Soodăn′ as far as Timbŭc′too, 16° N. lat., it bends round south-east and south, and intersecting the Kŏng Mountains in about 6° E. lon., it flows across the lowlands into the Gulf of Guĭn′ea, after a course of more than 2300 miles. At the point where the Nī′ger breaks through the mountains, it receives a large tributary coming from the east and north. This is the Tchăd′da River, which is probably the outlet of Lake Tchăd. The Nī′ger, throughout its long, winding course, lies wholly between the 5th and 20th parallels of north latitude, and is subject to periodical inundations. In August the plains of Soodăn′ are covered with water and crowded with boats.

362. The coast of Guĭn′ea west from the Nī′ger is watered by many small streams from the Kŏng Mountains. The river system of Senegăm′bia comprises the Senegâl′, the Găm′bia, and the Rî′o Grän′de, which flow from the highlands in rapids, and pursue most of their course through a flat lowland. The Cŏn′go, or Zaîre′, rises in the southern table land, and flows west into the Atlantic, in about 6° S. lat. The Coăn′za runs west nearly along the 9th parallel of south latitude.

363. The Or′ange, or Garēēp′, is the largest of the southern rivers, having a long course on the table land of South Africa, and flowing westward into the Atlantic. Though a large stream in the rainy season, it is often dry. The great interior basin of the Or′ange River, which consists of grassy valleys, is separated from Caffrā′ria by the mountain crests which lie about 100 miles westward from the Indian Ocean.

364. All the rivers which flow across the plains of Mozambîque′ and Zanguebär′ into the Indian Ocean have their sources in the eastern edge of the table lands. The Zambē′ze, the Ozāy′, and the Jä′ba are the largest. They all have but little water at their mouths in the dry season, but in the rainy season they are navigable for many miles. Some still farther north do not reach the sea at all times of the year, but are lost in lakes or marshes, as the Häines, which approaches very near the Indian Ocean, then runs southward parallel to the coast, and falls into Băt′ti Lake.

Direction. Termination. Tributary. Limits of the Niger. Inundations.—362. Waters of the coast of Guinea. River system of Senegambia. The Congo. The Coanza.—363. The Orange. Basin of the Orange.—364. Rivers

§ 6. LAKES OF AFRICA.

365. The principal region of African lakes is the plains of Soodăn′, and the country along the base of the northern declivity of the table land. Lake Tchăd is the largest, and is in the very centre of the continent. It is as yet but imperfectly known. It receives many affluents from the surrounding country, and is supposed to be connected with the Nī′ger through the Tchăd′da River. Lake Fĭt′tre and Lake Hăd′i-ba, situated to the east of Lake Tchăd, are supposed to contribute their waters to it.

366. Lake Dĭb′bie is an expansion of the Nī′ger west of Timbŭc′too. The beautiful Lake Dĕm′bea, in Abyssĭn′ia, pours its waters into the Blue Nile. Lake Marä′vi, in the southern table land, is a long, narrow lake, situated west of Zanguebär′ and Mozambîque′. Its course is from south-east to north-west, and is supposed to be connected with the Nile. Lake N'gä′mi, recently discovered, is situated in 20° S. lat., and 22° E. lon., and has been but partially explored. Its outlet, the Zôu′ga, has not been traced to a termination.

§ 7. GEOLOGY OF AFRICA.

367. Granite, which is the base of Southern Africa, rises to a considerable height in many places, and is generally surmounted by vast horizontal beds of sandstone, which cause the peculiar flatness of the summits of many of the Cape mountains. Granite comes to the surface in the lower parts of Abyssinia, but sandstone predominates in the upper parts, and assumes the tabular form, often lying on the tops of mountains in enormous flat masses. Large tracts of ancient volcanic rocks occur in Shōa. Trap rocks abound in some parts, with basâlt′. The base of the sandy parts of North Africa is stiff clay; in Lower Nubia red and white granite prevail, followed by argillā′ceous sandstone. Middle Egypt is calcareous; and lower down the alluvium of the Nile covers the surface.

---

of Mozambique and Zanguebar. Three largest. Haines River. — 365. Lake region of Africa. Lake Tchad. Lake Fittre and Lake Hadiba. — 366. Lake Dibbie. Lake Dembea. Lake Maravi. Lake N'gami. — 367. Geology. Structure of Southern Africa. Abyssinia. Northern Africa. Lower Nubia. Middle Egypt, &c.

TABLE OF MINERALS OF AFRICA.

DIAMONDS. — Algē′ria.

OTHER PRECIOUS STONES. — Lower Guinea, Egypt.

GOLD. — Guinea, Soodăn′, sources of the Nile.

SILVER. —Eastern Africa, Soodăn′.

COPPER. — Soodăn′, Eastern Africa, Southern Africa, region of the Nile, Mo-rŏc′co.

LEAD. — Algē′ria, &c.

IRON. — Soodăn′, Southern Africa, Eastern Africa, Algē′ria, and Abyssĭn′ia.

SALT. — Morŏc′co, Abyssĭn′ia, Soodăn′.

§ 8. QUESTIONS FOR REVIEW.

368. Wherein does the contôur′ of Africa differ from that of other continents?

What features of relief predominate?

By what is the southern half of the continent occupied? What the northern half?

Does any portion of Africa belong to the great mountain zone of the old world?

Describe the Atlas system of mountains.

What elevation has the mountain knot of Morocco?

What are the extent and height of the table land of Bär′ca?

Where is Table Mountain?

Of what range is it the commencement?

What three sections compose this range?

Where do the Mountains of the Moon attain their greatest elevation?

Location and height of Mount Kilimanjaro?

What river is supposed to originate in this region?

What mountains in Abyssinia?

Where are the Kŏng Mountains, and what is their elevation?

What mountains near the coast of Biăf′ra?

What kind of declivity forms the descent from the southern table land on three sides?

What is the supposed structure of the northern declivity?

Describe the promontory of Abyssĭn′ia.

What is the height of the plateau of Tĭ′gre?

By what is the elevated country of Abyssĭn′ia characterized?

What are the physical aspects of Soodăn′?

Between what parallels of latitude is the Sahä′ra Desert?

By what fertile countries is it bounded?

What are its length and breadth?

In which part of the desert are oases most frequent?

What are the physical aspects of Egypt and Nubia?

What is the character of the lowland of Cape Colony?

What of the plains of Biăf′ra and Benîn′?

Which is the chief of the river systems of this continent?

What two large streams unite in the plains of Sennaar to form the Nile

Trace the course of the White Nile.

Trace the course of the Blue Nile.

What are the latitude and longitude of their junction?

What tributary of the Nile joins it below the junction?

What singular circumstance attends the Nile below the confluence of Tacăz′ze?

How does the Nile enter the sea?

What would Egypt become should the Nile cease to flow?

In what part of Africa is the River Niger?

Trace its course.

What tributary of the Niger flows from the eastward?

Describe the river system of Senegăm′bia.

Where are the Cŏn′go and Coăn′za Rivers?

Which is the chief river of South Africa?

What are its rise, course, and termination?

Which is the *lake region* of Africa?

Name the principal lakes.

CHAPTER XI.

SPECIAL GEOGRAPHY OF AUSTRALIA AND ADJACENT ISLANDS.

369. Australia is the smallest of the three southern continents, and though reckoned with the continental group of the Old World, is wholly detached from it. It lies south of the Asiatic Archipelago, between 10° and 39° S. lat., and 113° and 154° E. lon.; having the Pacific Ocean on the E., the Southern Ocean on the S., the Indian Ocean on the W., and on the N. the Sea of Timor and Torres Strait, separating it from Timor and Papua. Its length from east to west is about 2700 miles, breadth from north to south near 2000 miles, and comprising an area of nearly 3,000,000 square miles, with a coast line of 7600 miles, or 1 to 390 miles of surface.

370. Australia, like the continents of Africa and South America, is but little indented with branches of the ocean. The principal indentations are the Gulf of Carpentaria and Cambridge Gulf on the north, Port Philip, the Gulf of St. Vincent, and Spencer Gulf on the south, and Shark Bay, with a few others, on the western coast. Only the south-eastern part, with small sections in the south and west, and an inconsiderable tract in the north near Port Essington, have as yet been thoroughly explored. Much of the interior of this continent is still unknown.

371. The most remarkable feature of the eastern side is a long chain of mountains near the coast, extending from Cape York at Tŏr′res Strait, south to Wilson Promontory, and is continued through the whole of Văn Diē′men's Land to South Cape, where it ends. In the northern parts the chain is low, but about 30° S. latitude it assumes the form of a regular mountain chain. The average elevation is between three and four thousand feet. The Australian Alps, or Warragong Mountains, belong to this chain, and are constantly covered with snow. Mount Kosciusco, one of the peaks of this range,

---

369. Australia compared with the other continents. Boundaries. Extent. Area. Coast line.—370. Bays. Straits. Explored parts. Of the interior.—371. Eastern portion. Average height of the highlands. Loftiest summits.

rises to the height of 6510 feet, and Mount York in the Blue Mountains rises to 3292 feet. The rugged and savage character of these mountains far exceeds what might be expected from their height. The spurs give them a terrific character, and in many places render them inaccessible, both in New South Wales and in Văn Diē′men's Land. These spurs shoot right and left from the main range, equal to it in height, and separated from it and from one another by dark gullies, impassable precipices, and streams flowing through them in black, silent eddies, or foaming torrents.

372. In New South Wales, the country slopes westward from these mountains to a low, flat, unbroken plain. On the east side, darkly verdant and round-topped hills and ridges are promiscuously grouped together, leading to a richly-wooded, undulating country, which gradually descends to the coast, and forms the valuable lands of the British colony. On the western side of Austrā′lia, the land is generally inferior near the coast, with richer tracts near the rivers. None of the rivers of Australia are navigable to any great distance from their mouths. The Mur′ray River, which, with its tributaries, is said to drain a surface of 400,000 square miles, flows into the sea by a very small mouth. The want of water is severely felt in the interior, which, as far as known, is a treeless desert of sand, swamps, and jungle.

373. PRODUCTIONS. — Granite, sandstone, limestone, coal, and slates are the chief mineral products; and rich ores of gold, copper, and lead have recently been discovered. The gold district is at Bathurst, at the foot of the Blue Mountains, about 100 miles west of Sydney. Of the 5710 plants discovered in Australia, 5440 are peculiar to it. It is remarkable that, with one or two exceptions, there are no indigenous fruits. Timber in general is of inferior quality. Sheep farming is the most flourishing branch of industry, and it is principally as a wool-growing country that Australia is rising in commercial importance. SYDNEY, the capital and largest town, has one of the best harbors in the world. The other important places are Melbourne, Portland Bay, Albany, Freemantle, and Perth. Hobart Town is the capital of Van Diē′men's land.

374. NEW ZEALAND, divided into three islands by rocky and dangerous channels, is superior to Australia in soil, fertility, and beauty. High mountains, of volcanic origin,

---

Character of these mountains. — 372. Reliefs of New South Wales. The land on the west. Murray River. Of water in the interior. — 373. Minerals. Gold region of Australia. Plants, &c. Sydney. Other towns. Hobart Town. — 374. New extend through the islands, which, in the most northerly, rise to nearly 10,000 feet above the sea, with two thirds of their height buried in snow and glă′ciers. The coast is a broken country, covered with a luxuriant but dark vegetation. There are table lands of great extent, without a tree, but the mountain ridges are clothed with dense and gigantic forests. There is much good land, and many lakes, with navigable rivers, the best of harbors, and a mild climate. Auck′land is the capital.

375. Papua or New Guinea, next north of Australia, is 1100 miles long, and 400 wide, with mountains rising to the height of 16,000 feet, capped with snow. From the little that is known of it, it is believed to be one of the finest countries in that region. The bird of paradise is found here.

376. Borneo, a large island north-west of Australia, is crossed by the equator, and traversed through its whole length by magnificent chains of mountains. Fine rivers flow from them to the plains. Diamonds, gold, and antimony are among its minerals; gums, gûtta percha, precious woods, and all kinds of spices and tropical fruits are among its vegetable productions. Bornē′o is the chief town.

377. The Sunda Group of islands, comprising Sumatra, Java, Bally, Sumbawa, Floris, Sandalwood, and Timor, form one of the most terribly active regions of volcanic action in the world, and there is not a spot of its size on the face of the earth that contains so many volcanoes as the Island of Java. A range of volcanic mountains, from 5000 to 14,000 feet high, forms the central crest of the island, and ends to the east in a series of 38 separate volcanoes with broad bases, rising gradually into cones. Most of them are of great antiquity, and are covered with thick vegetation. Some are extinct, or only emit smoke; from others sulphurous vapors issue with great violence; one has a large crater filled with boiling water, and a few have had fierce eruptions of late years. In 1772 the greater part of one of the largest volcanic mountains was swallowed up, after a short but severe combustion; a luminous cloud enveloped the mountain on the 11th of August, and soon after the high mass actually disappeared under the earth with tremendous noise, carrying with it about 90 square miles of the surrounding country, 40 villages, and nearly 3000 of their inhabitants. The northern coast of Java is flat and swampy, but the southern parts are beautiful and romantic, yet in the lovely, peaceful valleys, the stillness of night is

---

Zealand. Divisions. Mountains. The coast. Table lands. Capital. — 375. Papua. — 376. Borneo. Minerals and vegetables. — 377. Of the Sunda Islands.

disturbed by the deep roaring of the volcanoes. In Sumatra the extensive granitic formations of Eastern Asia join the volcanic series which occupies so large a portion of the Pacific. This most beautiful of islands presents the boldest aspect; it is indented by arms of the most transparent sea, and watered by innumerable streams; it displays in its vegetation all the bright coloring of the tropics. Here the submarine fire finds vent in three volcanoes on the southern, and one on the northern side of the island.

378. The principal trading places in the Asiatic Archipelago, besides those already mentioned, are Batā′via, Samarăng′, and Sourabaȳ′a, in Jä′va; Amboy′na, Côupang′, in Tīmōr′; Macăs′sar, in Cĕl′ebēs; Manĭl′la, in Luzōn′; and Achēēn′, in Sumatra.

379. Polynesia includes the numerous islands scattered over the Pacific Ocean, eastward from Asia, and the Asiatic Archipelago. They are divisible into three classes — the mountainous, the hilly, and the low cŏr′alline; but with this exception, there is a general similarity of character throughout the whole. Though the greater part of these islands are within the tropics, and the climate necessarily warm and little subject to change, the heat is softly tempered through the influence of the vast body of water that surrounds them, thus rendering the temperature delightful. The bread fruit tree supplies food, timber, gum, and cloth, which is made from the fibres of its bark. The cō′coa nut tree affords food, drink, cloth, and oil. There are plăntains, banä′nas, yăms, sweet potatoes, tä′ro root, and sugar cane.

380. These islands are mostly collected in groups, and are included in the following classification: 1st. The Bonîn′ Islands; 2d. The Ladrōne′ Islands; 3d. The Căr′olīne Islands; 4th. The Feejēē′ Islands; 5th. The Tŏn′ga, or Friendly Islands; 6th. Navigātor's Islands; 7th. Cook's Islands; 8th. The Society, Georgian, and Low Islands; 9th. The Austral Isles; 10th. The Marquē′sas and Washington Islands; 11th. The Sănd′wich Islands; 12th. The Ker′madec Islands; and 13th. The Scattered Islands.

381. The Sandwich or Hawaiian Islands are the most interesting and important in Polynē′sia. Hawaī′i is the largest, and is noted for the lofty summit of Mau′na Rō′a, 16,000 feet

---

Java. Volcano in 1772. Sumatra. — 378. Other places of trade. — 379. Polynesia. Classes of islands. Climate and temperature. Productions. — 380. Number of classes or groups. Their respective names and situation. — 381. The Sandwich Islands. Hawaii. Mountains. Influence of missionaries. Honolulu.

high; and the volcano of Kirawah, which, for extent, grandeur, and intensity of action, is the most frightful active volcano in the world. In 1819, through the influence of missionaries, the natives renounced their idols, and embraced Christianity. The Bible and other books have been translated into their language, and churches and schools established. Honolū′lu, in the Island of Oahū′, is the seat of government and trade. The commerce is in the hands of the Americans.

CHAPTER XII.

GENERAL AND COMPARATIVE VIEW OF THE CONTINENTS.

"The earth is the Lord's, and the fulness thereof; the world, and they that dwell therein." — *Ps.* xxiv. 1.

382. THE vast continent of AMERICA, or the NEW WORLD of the western hemisphere, extends through upwards of 130 degrees of longitude, from Cape St. Rōque, the most easterly projection of South America, to Cape Prince of Wāles, the most westerly point of North America. It embraces more than 120 degrees of latitude, reaching from Point Băr′row, in 72° N. lat., to the Strait of Magĕl′lan, in 54° S. lat., a distance of about 9000 miles. It consists of two enormous triangular bodies of land joined together by the Isthmus of Panamä′. All the distinguishing features of this continent are formed on the most gigantic scale, and are characterized by simplicity and unity.

383. The mountain chain, which traverses its whole extent from north to south, is the broadest, and, excepting the Himalȳ′a Mountains of Asia, the loftiest in the world. The greatest elevation is Mount Aconcä′gua, in Chî′le, 23,910 feet in height.

384. Within the limits of this continent there is every variety of climate, from the extreme heat of the torrid zone to the perpetual winter of the polar regions. And the mountains are so lofty, that the same extremes of heat and cold may be experienced in a journey of a few hours, from the burning plains of Peru to the ice-clad peaks above.

385. The plains, rivers, bays, lakes, cataracts, and forests of America are of unrivalled extent and grandeur. The number of considerable rivers is estimated at about 140. The animal and vegetable kingdoms present the same most remarkable developments and most wonderful forms. Its

---

382. Extent of the American continent from east to west. From north to south. It consists of what? Characteristics. — 383. Its grand mountain chain. Point of greatest elevation. — 384. Of climate. — 385. Plains, rivers, &c., of

mineral resources have enriched the world with its precious and useful metals.

386. The GREAT EASTERN CONTINENT, or OLD WORLD, is determined in its form by an immense zone of mountains and plateaus, extending from the coast of Barbary and Portugal, on the Atlantic, eastward to the farthest extremity of Asia, at Bĕhr′ing's Strait. The highest point of land, Mount Kunchingĭn′ga, is in Central Asia, reaching the enormous height of 28,178 feet. The greatest depression is the shore of the Dead Sea, which, at the water level, is upwards of 1300 feet below the level of the Mediterranean.

387. The Spanish and Atlas Mountains form the western extremity of the mountain zone; and, though now separated by the Straits of Gibrâl′tar, these two ranges were undoubtedly once united, as their geological formation and the direction of their chains strongly indicate. North of the mountain zone lies a vast plain, extending almost from the Pўr′enees Mountains to the eastern extremity of Asia. The greater portion of this plain is nearly a dead level, broken only by the Scandinā′vian and U′ral Mountains. The lowlands south of the mountain zone are much indented by the ocean, and present the most diversified aspect. The greater part of the flat country lying between the Chī′na Sea and the River Indus is exceedingly rich and productive, while that between the Persian Gulf and the foot of the Atlas Mountains is, with some exceptions, one of the most desolate tracts on the face of the earth. The southern lowlands are also broken by a few mountain systems of considerable extent and height. The number of considerable rivers is estimated at about 440. The eastern world is usually considered as a group of three distinct and well-defined continents, having Asia as the body, with Europe and Africa as peninsular attachments.

388. The great continents present marked differences and resemblances, when viewed in comparison. *There is a manifest difference in the grouping.* The eastern world is consolidated, while the western appears spread apart. The great mass of the former is north of the equator, and in the temperate zone, while the latter extends from north to south through four zones.

389. Both continents commence with *a broad expanse*

America. Animal and vegetable kingdoms. Minerals. — 386. By what is the form of the great eastern continent determined? Point of greatest elevation. Of greatest depression. — 387. Of the Spanish and Atlas Mountains. The great northern plain. The lowlands south of the mountain zone. Mountains in these lowlands. Divisions of the Old World. — 388. Comparison of the great continents. Of the grouping. — 389. Of the northern and southern *towards the north, and narrow down to a point towards the south.* The most important peninsulas are also thus marked; as that of Aliăs′ka, Califŏr′nia, Flŏr′ida, Scandinā′via, Spāin, Italy, Greece, Hindostăn′, In′do-Chī′na, Corē′a, and Kamtchăt′ka. Almost all peninsulas extend in a southerly direction from the continent.

390. *The southern points of all the continents are high and rocky, with islands or shoals as appendages.* South America terminates in the rocky promontory of Cape Hörn and the Tĕr′ra dĕl Fuê′go Islands; Africa, at the Cape of Good Hope, in high plateaus with the Agŭl′has Cape and banks; Hindostăn′, at Cape Cŏm′orin, in the Ghâuts Mountains; and Austrā′lia terminates at South Cape, in Van Die′men's Land, with high mountains.

391. *A large island, or group of islands, lies to the eastward of these southern extremities.* South America has the Fâlk′-land group; Africa has Madagăs′car; Hindostăn′ has Ceylōn′; and Austrā′lia has New Zēa′land.

392. *A curved indentation may also be observed in the western coasts* of the continents, forming a vast gulf—in South America, at Arî′ca, in Perŭ; in Africa, at Biăf′ra, forming the Gulf of Guinea; in Hindostăn′, at the Gulf of Cambāy′; and in Austrā′lia, forming the Great Australian Bīght.

393. *A remarkable parallelism* exists between the eastern coast of America and the western coast of Europe and Africa, the projections of one corresponding to the indentations of the other. The point of Cape St. Rōque answers to the Gulf of Guĭn′ea, and that of Cape Vĕrd to the Gulf of Mexico.

394. *The great masses of land are grouped two by two, in three double continents,* either united by an isthmus or by a chain of islands, having an archipĕl′ago on the east, and a peninsula on the west side. North and South America form a double continent, united by the Isthmus of Dariĕn′, with the West India Islands on the east, and the peninsula of California on the west. Europe and Africa form a second double continent, having Italy and Sicily for their connecting link, with the Grecian Archipĕl′ago on the east, and the Spanish peninsula on the west. Asia and Australia form the third double continent, having for their bond of union the continuous chain of islands between Malāy′a and

---

extremes of the continents. The peninsulas.—390. Southern points of all the continents. Examples.—391. Islands eastward of these points.—392. Resemblance in the western coasts.—393. Parallelism of the Atlantic shores.—394. Double continents and their appendages. Of North and South America.

Austrā'lia, with the East Indian Archipĕl'ago on the east, and the peninsula of Hindostăn' on the west.

395. A great difference prevails among the several continents respecting *the extent of their coast line.* Some, being deeply indented with gulfs and inland seas, and having several peninsulas, have a very extended coast line; while others, more compact, and with few indentations or projections, have a comparatively short line of coast. The following table exhibits these differences: —

Continents.	Square Miles.	Length of Coast Line.	Sq. Miles for 1 of Coast.
Europe, ...	3,900,000	17,000	229
North and Central America, . . .	8,000,000	24,000	345
South America, ...	8,200,000	13,600	602
Asia, ...	17,500,000	35,000	500
Africa, ...	11,870,000	16,000	741
Australia, ...	3,000,000	7,600	390

396. Europe is more varied in its outline than either of the other continents. It is deeply indented in all parts by the ocean and by inland seas, and seems almost entirely made up of peninsulas. Nearly half its surface is occupied by waters within its limits, rendering it the most accessible of all the continents.

397. Asia has the large peninsulas of Arā'bia, Hindostăn', and In'do-Chī'na on the south, Corē'a and Kamtchăt'ka on the east, with Chī'na and Mantchôu'ria projecting forward into the ocean. These, however, comprise only one fifth of its entire mass.

398. Africa is the most simple in its outline, having an oval form, with no important peninsulas, and nowhere admitting the sea.

399. North America resembles Europe more nearly in its extensive and irregular coast line. The Arctic coast is very much broken with gulfs and inlets, and the Atlantic coast has several important bays and gulfs.

400. South America is but slightly indented by the sea, excepting its south and south-west portion, where the coast is broken by sounds and fiords which run far into the land.

401. Remarkable resemblances and differences in the *reliefs* of the continents also present themselves to view. All

---

Of Europe and Africa. Of Asia and Australia. — 395. Difference in extent of coast line. Table. — 396. Describe Europe in its coast line. — 397. Asia. — 398. Africa. — 399. North America. — 400. South America. — 401. Remark on the reliefs of the continents. Line of highest elevation. Relative position the continents rise gradually from the sea shores towards the interior, to *a line of highest elevation.* This line of greatest elevation is not placed midway between the sea shores, but runs nearer to one than to the other; hence there are two slopes, unequal in length and inclination. In the Old World the long slopes are towards the north, and short slopes towards the south. In the New World the long slopes are towards the east, and the short slopes towards the west.

402. In this line of highest elevation itself we observe a gradual descent from the highest or culminating point towards the extremities, in two unequal inclinations. In the Old World the highest elevation is in the Himalaȳ'a, the long descent extending towards the west, and the short towards the east. In the New World the highest elevation is in the Andes, in Chî'le, the long descent extending towards the north, and the short towards the south.

403. Thus *all the long and gentle slopes descend towards the Atlantic and Arctic Oceans; and all the short and rapid slopes descend towards the Pacific and Indian Oceans.* "In this point of view," says Professor Guyot, "these two great oceans appear as two basins of different geological character. The Pacific seems an immense basin which has sunk down, and whose high and ragged edges present on all sides the abrupt terminations of the continents. It is on this great line of fractures, on the borders and all round this ocean, that we behold *the great majority of the active volcanoes of our globe, arranged like an immense burning crown.* The Atlantic, on the contrary, seems a simple depression in the form of a trough, owing, perhaps, to a lateral pressure, and partly to the tilting motion which lifted up the lands in the neighborhood of the Pacific. Hence its narrow breadth, the valley form, the absence of numerous islands in the interior of its basin, and the descent of all the neighboring continents by gentle slopes."

404. *In the distribution of mountains, plateaus, and plains,* we also perceive remarkable differences between the two great continents. In the Old World mountains and plateaus predominate. Central Asia is traversed by four immense chains of mountains, supporting vast table lands, which are more than 2400 miles long and 1500 miles wide, and from 5000 to 14,000 feet in elevation. Here are also the loftiest summits on the globe. The principal mass of Western Asia is a plateau

---

of this line. Long and short slopes of the Old and New World. — 402. Fact observable in this line of highest elevation itself. Where is the culminating point in the Old World? Where in the New? — 403. Summary view of the slopes. Remark on the Pacific Ocean. — 404. Distribution of mountains, from 3000 to 6000 feet in elevation. Africa, south of the Sahä′ra, is an enormous pile of uplifted lands. Mountains and plateaus cover five sevenths of Asia and two thirds of Africa.

405. In the New World the plains predominate, forming two thirds of its surface. The highlands, in a narrow band, run along the western border of the two Americas, while almost the whole east extends in immense plains. If we compare the plains of the Mississippi and the Amazon with those of Sibē′ria and Sahä′ra, we shall perceive a very striking contrast. In the former we find a happy climate, a rich and fertile soil, a luxuriant vegetation, and inexhaustible resources, thus combining all the requisites for the prosperity of a country. In the latter we have a frozen waste in Sibē′ria, and a burning sandy desert in Sahä′ra, both alike useless to man.

406. A characteristic feature of Western Europe (not including Rŭs′sia) is that of mountains without plateaus at their base. From one end of Europe to the other, whether over its central mass or its peninsulas, its surface is modified, cut in all directions, by mountain chains intersecting each other. In all this part of the continent, the largest plain — that of Northern Germany and Poland — is only 600 miles long by 200 broad; and the plains of France, Hungary, and Lŏm′bardy are smaller in extent.

407. The mean height of the continents, or their elevation above the level of the sea, depends not so much on the mountain chains as on the gentle but extensive and compact swellings of the plains, and the development of the table lands. Humbōldt has calculated that the Pỹr′enees Mountains would produce upon the whole of Europe, if spread over its surface, scarcely the effect of 6 feet elevation, and the Alps about 22 feet, while the plateau of Spain would produce an effect of 76 feet. If the vast range of the An′des were pulverized and spread evenly over the eastern plain of South America, it would raise the surface only about 500 feet. The mean height of Europe is estimated at 670 feet; North America, 750 feet; South America, 1130 feet; and Asia, 1150 feet. The mean elevation of the whole land

---

plateaus, and plains. Which predominate in the Old World? Of Western Asia. Of Africa south of the desert. Extent of Mountains and plateaus in Asia and Africa. — 405. Extent of plains in America. Relative position of plains and highlands. Comparison of the plains of the western with those of the eastern continent.. Characteristics of the former. Of the latter. — 406. Characteristic feature of Western Europe. Limited extent of the European plains. — 407. On what does the *mean height* of the continents depend? Cal-surface of the earth is 920 feet. The culminating point of Europe is Mont Blanc, 15,739 feet; of North America, Mount St. Elias, 17,860 feet; of South America, Mount Aconca'gua, 23,910 feet; of Asia, Mount Kunchingin'ga, 28,178 feet; and of Africa, Mount Kilimanjaro, 20,000 feet.

---

culation of Humboldt with regard to the Pyrenees, Alps, and the plateau of Spain. Also of the Andes. Estimates of the mean height of the continents, and of the whole land surface of the earth. Culminating point of each continent.

CHAPTER XIII.

GENERAL AND COMPARATIVE VIEW OF THE OCEANS.

"For he hath founded it upon the seas, and established it upon the floods." — *Ps.* xxiv. 2.

408. The Continents determine the general outlines of *the great ocean basins.* The Pacific and Atlantic almost surround the principal masses of land. The Pacific, the Indian, and the Atlantic Oceans correspond to the three double continents, and separate them from one another. Each of them is also divided into a northern and southern basin, except the Indian Ocean, which is only a half ocean. These oceans have a broad opening at the south, and are narrowed to a point at the north, which is the reverse of the continents.

409. The Pacific is an oval form, wide at the south, the sides nearly meeting at the north, being only separated by Bēhr′ing's Strait, which leads into the Arctic. The Indian Ocean has the form of a triangle, with the vertex towards the north. The Atlantic has the form of a valley, with nearly parallel sides.

410. The oceans differ in *the indentations of their shores.* The forms may be classified under three species, viz.: first, land-locked seas, being cut off from the body of the ocean by peninsulas and chains of islands; second, open seas or gulfs; and third, inland seas, being nearly surrounded by land in a continuous shore.

411. In the Pacific we find the *land-locked seas.* There are no less than five along the Asiatic coast — the Sea of Kamtchăt′ka, closed in by the peninsula of Aliăs′ka and the chain of the Aleŭ′tian Islands; the Sea of Okhŏtsk′, enclosed by the peninsula of Kamtchăt′ka and the Kŭ′rile Islands; the Sea of Japăn′, enclosed by the Japan Islands; the Yĕl′-

---

408. Outlines of the ocean basins. Correspondence between the oceans and continents. Reverse contours of the oceans. — 409. Describe the Pacific Ocean. The Indian Ocean. The Atlantic Ocean. — 410. Indentations of their shores. Three species of indentations. — 411. Prevailing form in the Pacific. Sea of Kamtchatka. Sea of Okhotsk. Sea of Japan. Yellow Sea. China

low Sea, enclosed by the Lôô-Chôô and Formō′sa Islands; and the Chī′na Sea, enclosed by the Philĭp′pine Islands and Bornē′o. The only indentation on the American shore is the Gulf of California.

412. The Indian Ocean is marked by the *open seas* — as the Sea of Arā′bia and the Bay of Bengâl′. There are also two midland seas extending into the interior — the Red Sea and the Persian Gulf.

413. The Atlantic Ocean is characterized by *inland seas*, advancing far into the lands, and piercing the very heart of each continent. On the European side are the Mediterranean Sea, comprising three great basins, — the western, the eastern, and the Black Sea, besides several others of less extent, — and the Bâl′tic Sea, with its various branches. On the American side are the Gulf of Mexico and Hudson's Bay. In addition to these, we have, as instances of land-locked seas, the Caribbē′an Sea, enclosed by the Antîlles′ Islands and the peninsula of Yucatăn′; and the Gulf of St. Lawrence, enclosed by Newfoundland Island and the peninsula of Nō′va Scō′tia; also, the Gulf of Guĭn′ea and Bay of Bĭs′-cay, as open seas. Thus the Atlantic is the most broken in its shores, when compared with the other oceans.

414. One of the most interesting characteristics of the oceans is found in *the islands*. These have been classed as Continental and Pelă′gic. The Pacific Ocean exceeds all others in the number and extent of its islands, whether continental or pelă′gic. The East Indian and Austrā′lian archipelagoes are the largest of the continental class existing on the surface of the globe; and the thousands of pelă′gic islands with which its centre is studded have not a rival. The Atlantic possesses, in the West Indies, the British Isles, and those of the Mediterranean, continental islands of great importance; but its pelă′gic islands are comparatively few — the Azōres′, Madêi′ra, Canā′ries, Cape Vërd, and St. Helē′na being the chief. The Indian Ocean has the Islands of Madagăs′car and Ceylōn′ as representatives of the continental, while Maurĭ′tius and Bourbōn′, with a few others, represent the pelă′gic. These various peculiarities of the oceans modify, in a greater or less degree, the commercial relations among the nations of the world.

Sea. Gulf of California. — 412. Prevailing form of seas in the Indian Ocean. — 413. Prevailing form of seas in the Atlantic Ocean. Those of Europe. Of America. Land-locked seas of the Atlantic. Open seas. — 414. Another characteristic of the oceans. Islands of the Pacific. Islands of the Atlantic. Islands of the Indian Ocean. Effects of these peculiarities of the oceans. —

415. *Full three fourths of the solid crust of the earth lie buried beneath the waters.* The ocean basins are not merely continuations of the general reliefs of the continents. On leaving the greater part of the shores, the submarine ground descends slowly, in a proportion somewhat similar to the general slopes presented by the ground above water on the continents; but at a point more or less distant from the shore the slopes abruptly change, the depths suddenly increase, and often become ten times as great at a short distance. The *greatest ascertained depths* are found in the middle regions of the Atlantic. These depths equal, or surpass by several thousand feet, the highest mountain summits on the globe, and are found, like them, in the neighborhood of the tropics.*

416. Certain interior seas, like the Mediterranean and Caribbē′an, are deeper than would be expected from their nearness to the lands, and seem to be sunken basins, the result of volcanic agency. The Mediterranean is divided into two basins by a shoal that runs from Cape Bŏn to the Strait of Messî′na, on each side of which the water is exceedingly deep. A depth of more than 1000 fathoms has been sounded. The Caribbē′an Sea, in the deepest parts, is nearly 3 miles. The depth of the Bâl′tic Sea nowhere exceeds 167 fathoms, and is generally not more than 40 or 50 fathoms, from which cause, together with its freshness and northern latitude, it is frozen five months in the year. The depth of the basin which holds the waters of the Gulf of Mexico is, in the deepest part, about a mile and a half.

417. "The sea is the proper field for observing the operations of the general laws which govern the movements of the atmosphere. Observations on land will enable us to discover the exceptions; but from the sea we shall get the rule. Each valley, every mountain range, and local district, may be said to have its own peculiar system of calms, winds, rains, and droughts; but not so the surface of the broad ocean, for over it the agents which are at work are of a uniform character." — [Maury.]

---

* The Deep-Sea Sounding Apparatus, invented by Lieutenant Brooke, U. S. N., is so contrived that, on touching the bottom of the sea, the shot (usually 64 pounds weight) detaches itself from the line, but leaves a small iron rod or bolt, which (having a cup or hollow in the lower end filled with tallow) will bring up a specimen of the bottom. Professor J. W. Bailey, of West Point, has examined, by the microscope, a specimen brought up from a depth of 12,000 feet, and found it made up entirely of minute shells.

---

415. Extent of water surface. Forms of the ocean basins. Region of the greatest ascertained depths, compared with mountain summits. Note. Brooke's deep-sea sounding apparatus. — 416. Depth of the Mediterranean and Caribbean Seas. Of the Baltic. Of the Gulf of Mexico. — 417. The sea the field for observing the general laws of the atmosphere.

Exercises for Examination.

418. What is meant by physical geography?

To what system or group of bodies does the earth belong?

Mention three different modes by which the rotundity of the earth may be proved.

How is the earth placed in its orbit, and what is the consequence of this position?

How is the earth or globe divided for the convenience of measurement?

From whence is latitude reckoned?

What is meant by high and low latitudes?

What parallels of latitude divide the earth into zones?

For what cause have particular names been given to these zones?

Give some particulars about the number of miles contained in degrees of longitude, and their difference in different latitudes.

What is the length of a degree of longitude on the parallel of Boston? Of New York? Of New Orleans?

When are places said to be on the same meridian?

What is meant when we speak of the sun's being on the meridian?

What is the estimated proportion of land and water on the surface of the globe?

Under what general heads may the dry land be considered?

How is the land arranged in the western and in the eastern continents?

Mention the direction of the greatest extension of land in the two continents.

Describe the classes of islands.

Describe the variations in the reliefs of the land.

Mention the usual arrangement of mountains.

Give some account of mountain ranges.

What direction do they usually appear to take?

Name the chief mountain ranges which extend from north to south in the new continent.

Name the principal mountain ranges which extend across the old continent.

How are mountain ranges frequently disposed in peninsulas and islands?

Give some particulars about the appearance and form of mountains, and about glaciers.

What are mountain knots? Examples.

What are mountain branches and spurs?

What are detached or isolated mountains?

Where are the loftiest summits usually met with?

Give the names and heights of the culminating points of the several continents.

What is meant by plateaus?

Mention the most remarkable table land in Europe.

Mention plateaus in North America, in the Andes, and in Asia.

Describe plains or lowlands.

Name the most remarkable in North America.

Describe the lowlands of South America, and mention by what names they are distinguished.

Mention the plains of Europe. Of Asia. Of Africa.

What are the various kinds of valleys?

Describe each kind.

What various terms are applied to narrow valleys?

By what standard are the reliefs of the land measured?

Mention a tract of land below the sea level.

Under what heads may the waters of the globe be considered?

From whence do springs take their rise?

How are internal reservoirs supplied with water?

What forms the distinction between soft water, hard water, and mineral water?

What do you know of thermal or hot springs?

Whence do rivers derive their supplies of water?

What is meant by the term watershed?

What constitutes the basin of a river?

On what does the velocity of a river chiefly depend?

Describe cataracts, cascades, and rapids.

What are deltas? Estuaries?

Give some account of the different kinds of lakes.

CHAPTER XIV.

OF AIR AND WATER AS ENVELOPES OF THE LAND.

> "Thou coveredst the earth with the deep as with a garment: the waters stood above the mountains. At thy rebuke they fled." — *Ps.* civ. 6.

419. The land, or solid portion of the earth, has two envelopes, by one of which — the *sea* — it is partially surrounded; and by the other — the *air* — it is entirely surrounded. The air is an elastic fluid consisting of a mixture of *oxygen gas* and *nitrogen* or *azotic gas,* in the proportion of 21 parts of oxygen to 79 parts of nitrogen. It also contains a small quantity of *carbonic acid gas.* The constituents of water are 8 parts of *oxygen* to 1 part of *hydrogen.* These fluids are retained on the surface of the globe by the attraction of gravitation; that is, by a power which has been imparted to all particles of matter to draw towards them other particles of matter. This power of attraction is great in proportion to the size of any body, a large mass of matter having a much greater attractive power than a small one. As the solid land is of much greater size than the particles of air and water on its surface, it attracts them, and keeps them in their assigned places.* The sun and moon also possess this power of attraction, and, notwithstanding their distance from the waters on the earth's surface, they attract and draw them up to a certain elevation in the wide, open ocean.

420. "The atmosphere," in the language of Dr. Buist, "is a spherical shell, which surrounds our planet to a depth that

---

* The pressure or weight of the air upon the earth at the level of the sea is equal to about 14½ pounds on every square inch. This pressure is balanced by a column of mercury 30 inches in height; but at the elevation of 18,000 feet it would be balanced by a column only 15 inches in height; and so on. It is on this principle that the mercurial *barometer* has been constructed. Since the mercury in the barometer is found (with slight local variations) to stand at the same point at all places at the level of the sea, and to fall in a regular ratio as we ascend above that level, this instrument forms a most useful standard for measuring the altitude of any place, either mountain, hill, or plain, to which a barometer can be carried.

---

419. The envelopes of the land. — 420. Remarks of Dr. Buist on the proper-

is unknown to us, by reason of its growing tenuity, as it is released from the pressure of its own superincumbent mass. Its upper surface cannot be nearer to us than 50, and can scarcely be more remote than 500 miles. It surrounds us on all sides, yet we see it not; it presses on us with a load of nearly 15 pounds on every square inch of surface of our bodies, or from 70 to 100 tons on us in all, yet we do not so much as feel its weight. When in motion its force is sufficient to level the most stately forests and stable buildings with the earth, to raise the waters of the ocean into ridges like mountains, and dash the strongest ships to pieces like toys. It warms and cools by turns the earth and the living creatures that inhabit it. It draws up vapors from the sea and land, retains them dissolved in itself, or suspended in cisterns of clouds, and throws them down again as rain or dew when they are required. It bends the rays of the sun from their path, to give us the twilight of evening and of dawn; it disperses and refracts their various tints to beautify the approach and the retreat of the orb of day. But for the atmosphere sunshine would burst on us and fail us at once, and at once remove us from midnight darkness to the blaze of noon. We should have no twilight to soften and beautify the landscape, no clouds to shade us from the scorching heat; but the bald earth, as it revolved on its axis, would turn its tanned and weakened front to the full and unmitigated rays of the lord of day. It affords the gas which vivifies and warms our frames, and receives into itself that which has been polluted by use and is thrown off as noxious. It feeds the flame of life exactly as it does that of the fire — it is in both cases consumed, and affords the food of consumption — in both cases it becomes combined with charcoal, which requires it for combustion, and is removed by it when this is over."

421. If the solid part of the earth every where presented a uniformly even surface, the waters would completely envelop it, as does the air. But being broken into deep cavities and lofty mountains, elevated and depressed plateaus and plains, the waters are made to occupy the lowest parts, covering about three fourths of the whole surface. Its valleys, in some parts, sink beyond the reach of the ordinary sounding line, and its mountains often rise above the waters in chains or groups of islands.

---

ties and uses of the atmosphere. — 421. Supposition relating to the water The bed of the ocean. — 422. Conjecture with regard to the bottom of the sea

422. The bottom of the sea is probably much more rugged and abrupt than the surface of the dry land. Reasons why such should be the case are obvious. On the land the winds, the rains, and rivers are always abrading, drifting, and washing down the high places and filling up the low; these agents are but feebly, or not at all, felt at the bottom of the sea. On the dry land frosts and the force of gravity are great levellers; at the bottom of the sea no frosts are felt, and the difference of the force of gravity operating upon a rock at the bottom of the sea and at the top of a mountain is as the difference in weight between air and water.

423. These two envelopes of air and water constitute a natural whole, on which depends the difference of climate over the earth's surface, according to the relative extent of the fluid and solid parts, the form and aspect of the land, and the direction and elevation of the mountain chains.

424. Though the term *climate* has special reference to the character of the atmosphere, yet this is itself dependent on the constant influences of the ocean and the land: the ocean being every where agitated by currents of opposite temperature, and the land being greatly varied in form, elevation, color, and fertility. *The temperature, the winds, and the rain are the three principal elements of climate.* If we know the amount and distribution of these throughout the year, in any country, we may know what the climate is.

Reasons. — 423. What do the air and water constitute? — 424. Special reference of the term "climate." The atmosphere dependent on what influences. Principal elements of climate.

CHAPTER XV.

HEAT, ELECTRICITY, AND MAGNETISM.

"In the heavens hath he set a tabernacle for the sun; his going forth is from the end of the heaven, and his circuit unto the ends of it: and there is nothing hid from the heat thereof." — *Ps.* xix. 4–6.

§ 1. Of Heat.

425. The sun is the grand agent in diffusing light and heat over the surface of the globe. Through the admirable and beneficent adaptation of means to ends, in which the earth performs its annual journey round the sun, and its daily motion about its axis, all parts of its surface are successively exposed to the sun's rays; and owing to the inclined position of the earth in its orbit, the northern and southern hemispheres are alternately brought more or less directly under solar influence.

426. All bodies absorb and radiate heat; that is, they receive it and part with it. A rough or dark surface absorbs heat more freely than a smooth or light one. Under the same circumstances, bodies which soon become heated soon become cool; and those which are slow in heating are also slow in cooling. Grass, wood, and the leaves of plants radiate heat very freely, while polished metals, smooth pebbles, and woollens part with it slowly.

427. The direct effect of heat on all bodies is to *expand* them. Solids are increased in their dimensions, or converted into liquid or gaseous forms. Cold, which is a privation of heat, condenses and contracts the volume of nearly every thing. Gases and liquids become condensed or solid, and solids are rendered more compact. To this, however, there is an important exception. *Water*, at 42° of temperature, begins to expand, and, on becoming solid, exerts great force.

---

425. The sun. Results of the revolution and rotation of the earth. — 426. Of bodies in regard to heat. Rough and smooth surfaces. Law of radiation.

428. Heat converts water into vapor and steam, and both water and air are rendered lighter and more rare, and will rise through the denser portions above them. During the process of evaporation a certain quantity of heat is absorbed, becoming *latent*, that is, not perceptible to our senses. The more rapid the evaporation, the more intense is the cold produced. Evaporation goes on more freely in the wind than in still air. The sudden condensation of air, either by cooling or by compression, causes a quantity of latent heat to be set free, that is, to become sensible to the feelings, at the same time the vapor it may have contained is deposited in rain or dewdrops.

429. The earth, as a whole, is under the same laws of heat. Although part of the heat received from the sun in summer is radiated into the atmosphere, by far the greater part is absorbed into the earth, tempering the severity of the winter's cold.

430. The heating power of the sun's rays depends upon the manner in which they fall upon the earth. The higher the sun ascends above the horizon, the more directly do his rays fall, and their heating power is rapidly increased as they approach a perpendicular. The earth absorbs a far greater quantity of heat when it falls vertically than when it comes in an oblique direction; hence at the equator the temperature is highest.

431. Many causes, however, disturb this law, even between the tropics. The unequal distribution of land and water, the height above the sea, the nature of the soil, the position of the land surface with regard to the sun's rays, and the presence or absence of vegetation — all these modify the temperature more or less.

432. The atmosphere rests partly on the solid earth, whose mountain chains and elevated plateaus rise above its densest portions; and partly on the sea, whose surface forms a moving base, on which rest the lower and more humid portions of the air.

433. The air, when at rest, is a very bad conductor of heat, and is chiefly warmed by the heat which is radiated from the soil, and not by the passage of the sun's rays

---

—427. Direct effect of heat on bodies. Of cold. Exception. — 428. Effects of heat upon water and air. Of evaporation. Effects resulting from a sudden condensation of air. — 429. The laws of heat with regard to the earth. — 430. On what does the power of the sun's rays depend? Temperature. Where greatest, and why? — 431. Causes which disturb this law. — 432. On what does the atmosphere rest? — 433. The air. How warmed? By what is radiation through it. The radiation is most free when the sky is clear; clouds and even slight mists diminish the radiation, by intercepting its upward progress. Water has a great capacity for heat, but it is a bad conductor. It is warmed very slowly by the sun's rays. The temperature of the ocean, therefore, is remarkably uniform, and less liable to sudden changes than the atmosphere.

PROBLEMS FOR SOLUTION.

434. *a.* Which is best for keeping coffee hot upon the breakfast table, an urn of highly polished metal, or one of dark, rough material? Why?

b. With three glass cups I tried the following experiments. Into one I poured some boiling water, and the cup was immediately broken. Another I filled with cold water, and put it out of doors in a cold night; and on going for it in the morning, the water was solid and the glass was broken. A third cup I carried into a warm room, and filled it with ice-water; soon after which I saw water standing like perspiration on the outside of the cup. Now, how will you account for these different results?

c. I once saw a man preparing to ascend in a balloon from Boston Common, in the month of July. Among the various articles which he placed in his car were two overcoats, a pair of fur gloves, and a fur cap. What could he want of such things in midsummer in Boston?

d. If you wet your finger, and hold it up in the air, what sensation do you feel? Why?

e. Why are wet clothes dried sooner in the open air than in a confined room?

f. Many ponds are without water in the summer. Why is this?

g. Farmers have learned that a cold, wet piece of land becomes warmer and more productive by draining it. Why does draining land promote warmth?

h. Hedges and belts of trees are said to promote warmth, while forests produce cold. How will you account for this?

i. Why does dew fall more abundantly on cultivated soils than on barren lands and rocks?

---

promoted or retarded? Of water in relation to heat. Temperature of the ocean.

§ 2. ELECTRICITY.

435. Of ELECTRICITY in itself we know nothing more than that it is a mighty, imponderable agent, called, simply for convenience, a fluid. It pervades the earth, the air, and all substances, unperceived, when in a latent state, but exhibiting forces capable of producing the most sudden, violent, and irresistible effects when roused from its latent or neutral condition.

436. There are two states or kinds of electricity; one is called vitreous, or positive, the other resinous, or negative. Two bodies, each charged with different kinds of electricity, mutually attract each other, the two electricities coalescing with great rapidity, and causing a vivid light, called the electric spark, and accompanied by an explosion, upon which the neutral condition is restored.

437. The electricity of the atmosphere arises from evaporation and the chemical changes that are perpetually going forward on the globe. The ocean is one of the greatest sources of electricity in the atmosphere; combustion is another; and a large portion arises from vegetation. The air, when undisturbed by clouds, is almost always charged with positive electricity; the surface of the earth is always charged with negative electricity.

438. Clouds are very differently charged with electricity. Gray clouds have negative — red, white, and orange clouds positive. When clouds differently charged meet, an explosion takes place. When the sky is clear, and the air calm and warm, a succession of small, white, fleecy clouds, rising rapidly above the horizon, and flying swiftly in the very high regions of the atmosphere, is a certain presage of a thunder storm.

439. The velocity of lightning far surpasses the velocity of light. Its inconceivable velocity is beautifully exemplified in the electric telegraph. The rolling noise of thunder is probably owing to the difference between the velocity of lightning and that of sound. In passing to the earth, lightning follows the best conductors — metals by preference; then moist bodies — which is the reason why men and animals are so often struck with it.

— 435. Our knowledge of electricity. States and effects. — 436. Two kinds. Bodies differently charged. — 437. Sources of the atmospheric electricity. — 438. Clouds differently charged. — 439. Velocity of lightning. Thunder, what?

440. Electricity is perpetually effecting great changes in the earth's crust; not so much in its loud and fearful displays, which are evident to us, as in its unseen, quiet operations. To this powerful agent may be attributed the formation of the gems and crystals, which excite our admiration from their brilliancy and richness of color; and also, in all probability, many of the metallic deposits, which occur in the crevices and fissures of rocks.

§ 3. MAGNETISM.

441. MAGNETISM is one of those unseen, imponderable agents, which, like heat and electricity, are known only by their effects. Terrestrial magnetism, which pervades the whole earth, is very complicated. It varies both with regard to space and time, and probably depends upon the heat of the sun, upon his motion in the ecliptic which produces changes of temperature, upon galvanic currents circulating through the surface of the globe, and possibly upon the earth's rotary motion.

442. The distribution of terrestrial magnetism is determined by the declination needle, or mariner's compass, and the dipping needle. They consist of magnetized needles, or bars of steel, so suspended that the declination needle revolves in a horizontal direction, and the dipping needle moves in a plane perpendicular to the horizon. The north end of the declination needle or magnet points to the north, and the south end to the south, and it only remains at rest when in that position. The direction of the needle determines the magnetic meridian of the place of observation.

443. The magnetical meridians coincide with the geographical meridians in some places, and in these the magnet points to the true north and south, that is, to the poles of the earth's rotation. But if it is carried successively to different longitudes, it will deviate sometimes to the east, sometimes to the west of the true north.

444. The north end of the dipping needle bends or dips below the horizon in the northern hemisphere, and the south end bends or dips beneath it in the southern hemisphere, and between the two there is a line, which encircles the

---

Good conductors. — 440. Effects of electricity. — 441. Magnetism, how known? Terrestrial magnetism. Dependent on what? — 442. Its distribution, how ascertained? Describe the needles. What does the needle determine? — 443. Of magnetic and geographical meridians. Deviations. — 444. The dipping whole earth, where the dipping needle remains horizontal. That line, which is the magnetic equator, or line of *no dip*, crosses the terrestrial equator in several places, extending alternately on each side, but never deviating more than 12 degrees from it. The deviation is greater in that part of the Pacific where there are most islands, and it is greatest both to the south and north in traversing the continents of Africa and America. Hence it appears that the configuration of the land and water has an influence on terrestrial magnetism.

445. North and south of the magnetic equator the needle dips more and more, till at last it becomes perpendicular to the horizon in two points, known as the north and south magnetic poles, which are quite distinct from the poles of the earth's rotation. One is in 70° N. lat. and 97° W. lon.; the other is in 75° 5′ S. lat. and 154° 8′ E. lon.

---

needle. Magnetic equator. Deviations. Influence of land on magnetism. 445. — The magnetic poles.

CHAPTER XVI.

OF CLIMATE.

"While the earth remaineth, seed time and harvest, and cold and heat, and summer and winter, and day and night, shall not cease." — *Gen.* viii. 22.

446. The spherical form of the earth causes an unequal distribution of the sun's rays upon its surface, giving us the solar climates, or great zones of temperature. They are severally designated as the Torrid, the Temperate, and the Frigid Zones. These solar climates, however, are greatly modified by the geographical forms of the surface, and by the distribution and relative situation of the continents and seas.

447. Lands which lie remote from the influence of the ocean have a climate characterized by the extremes of heat and cold, by more violent changes, and a drier atmosphere. The sea and land, when near each other, and receiving the same quantity of heat from the sun, are differently affected in temperature. The sea is colder than the land during the day, and warmer during the night. So, also, in summer, the sea is cooler than the land, and in winter it is warmer. Thus the sea preserves a medium temperature, while the land is affected by extremes.

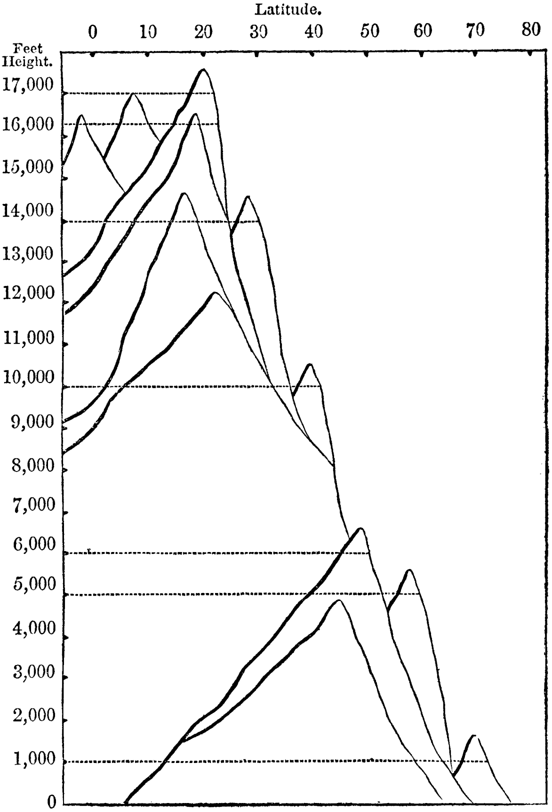
448. The temperature diminishes as we ascend from the ocean level, because the upper portions of the atmosphere are more and more rare, and are less affected by the radiated heat of the earth. A height of about 800 feet produces a change of 2° of temperature, and a height of 15,000 feet produces the same effect as a distance of 5000 miles from the equator.

449. There is no snow between the tropics, except on the tops of lofty mountains. The line of perpetual snow, in these hot regions, varies from 16,000 to 17,000 feet above the level of the sea. From these regions, north and south, it descends, till it grazes the earth near the polar circles. It will be per-

---

446. Effect of the earth's form upon the distribution of the sun's rays. By what are the solar climates modified? — 447. Lands remote from the influence of the ocean. Different effects on sea and land in proximity. — 448. Change of temperature in ascending from the ocean level. — 449. Of snow between the

ceived, however, by the annexed diagram, that the snow line is higher at the distance of 20° from the equator than at the equator itself. This is explained by the circumstance that the sun at the equator is never more than 12 hours above the horizon, whereas near the tropics the longest days are thirteen and a half hours in length; and as the sun at that period of the year is vertical, or nearly so, in that portion of the globe, the *summer* heat, on which the line of perpetual snow depends, is greater than immediately under the equator.



Height of Snow Line in different Latitudes in the Northern Hemisphere.

450. The limit of perpetual snow is varied, however, by circumstances. On the northern slope of the Himalaȳ'a Mountains the snow line is 3640 feet higher than it is on the southern slope, owing to the intense summer heats of the central table lands. The surface of these table lands is about 15,000 feet above the level of the sea, whilst on the southern side the mountains rise directly to a great elevation, from a flat country that is scarcely a thousand feet above the sea, and covered with a close jungle — a surface which is the least favorable for radiating heat.

451. On observing the temperature of a place, as registered by the thermometer, it is found to be constantly fluctuating through a certain range, above and below a standard mean. Temperature in equatorial regions is distributed tolerably equally over the whole year, owing to the days and nights being equal; but in mean and high latitudes, where the length of the day varies greatly, it takes a wide range above and below the annual mean. But in general the mean annual temperatures vary very little. The *Warmth Equator*, or line of the highest mean annual temperature, is not coincident with the geographical equator, but lies almost wholly to the north of it; occurring only to the south in the space between 150° W. lon. in the Pacific Ocean and the Sŭn'da Isles. Passing from the tropics towards the north pole, the temperature declines gradually, but much more rapidly in America and Eastern Asia than in Europe. Lines connecting all points having the same mean annual temperature, or nearly, are termed isothĕr'mal, signifying equal heat. Near the equator, the isothĕr'mals exhibit no great divergence from the parallels of latitude; but as we go farther north their inflections become remarkable, ranging through 20° and 25° of latitude.

452. In accurately defining the zones of climate, the tropics and polar circles are practically useless. Attending only to the isotherm, we may discriminate *five climatic zones* — the hot, warm, temperate, cold, and frigid.

— The Hot Zone is bounded on each side of the warmth equator by the isotherm of 80°. It includes the northern extremity of Australia, the islands and peninsulas of Southern Asia, the middle regions of Africa, the northern portion of

---

tropics. Height of *snow line*. — 450. Variation in snow line. Himalaya Mountains. — 451. Observation of the temperature of places. The temperature of equatorial regions. Of mean and high latitudes. Warmth equator. Of heat in receding from the tropics. Isothermal lines. Range in high latitudes. — 452. Comparison of the isotherms with the tropic and polar circles. The hot

Brazîl′, Guiä′na, Venezuē′la, New Grenä′da, Guatemä′la, with Jamāi′ca and a part of the West Indian groups. In this region, at the sea level, frost and snow are unknown. Vegetation is luxuriant and perennial in the well-watered districts, but burning deserts of sand and flint prevail.

— The Warm Zone lies between the isotherms of 80° and 70°, and includes, in the northern hemisphere, Mexico, Cuba, Florida, North-western and Northern Africa, (excepting a portion of the Barbary States,) Northern Arabia, almost the whole of Persia, Afghanistăn′, Beloochistăn′, Northern India, Bïr′man Empire, Siăm′, Cochin-Chī′na, south of China Proper, and the greater part of the Philip′pine Islands. The characteristics of this region are much the same as those of the preceding.

453. The Temperate Zone lies between the isotherms of 70° and 30°, and includes a large section of North America and Central Asia, Iceland, almost the whole of Europe, and a small strip of Northern Africa. In its southern portion we have the northern limit of the region of palms, and the principal district of the cultivation of the vine. Its northern boundary in Europe nearly corresponds with the most northern limit of barley and rye, and the appearance of trees. In this zone man has in all ages attained the highest development of his powers, and the most civilized nations have been located in it.

454. The Cold Zone lies between the isotherms of 30° and 10°, and includes the countries around Hudson's Bay, most of Labradōr′, Greenland, Spitzbĕr′gen, Nova Zĕm′bla, part of Lapland, part of North Rŭs′sia, and the greater portion of Siberia. Through a great part of this region, the soil at a varying depth remains permanently frozen throughout the year; but to a certain varying extent the surface is thawed by the powerful temperature of the short Siberian summer, so that wheat, barley, and rye ripen.

455. The Frigid Zone is bounded by the isotherm of 10°. It includes the countries in America to the north of Hudson's Bay, and a section of Northern Asia, between the Gulf of Obi, in about 80° E. lon., and the meridian of 160°, and between the mean latitude of 66° and the Arctic Ocean. The effect of cold upon vegetation is most apparent in this zone. The larch and birch pass within its limits, but they are stunted in form, and soon disappear.

456. A comparison of the climate of places situated in the

---

zone. Characters. The warm zone. Characters. — 453. Temperate zone. Characters.— 454. The cold zone. Characters.— 455. Frigid zone. Characters. — 456. Means for ascertaining the difference between a land and sea climate.

interior of continents, with that of islands under the influence of the ocean, in the same latitudes, will afford the best means for ascertaining the difference of a land and sea climate.

TABLE OF MEAN TEMPERATURE.

Lat. N.	Places.	Winter.	Summer.	Difference.
60° to 62°.	Faroe Islands,	38.5	54.0	15.5
	St. Petersburg,	16.3	60.8	44.5
	Yakootsk',	—38.0	63.0	101.0
50° to 52°.	Lands End,	44.6	60.4	15.8
	Barnâul', Sib.,	6.6	61.9	55.3
30° to 32°.	Madeira Islands,	61.3	70.0	8.7
	Caï'ro, Egypt,	58.5	84.6	26.1
31° to 32°.	Bermudas Islands,	59.2	75.2	16.0
	Natch'ez,	50.0	77.7	27.7

457. The average temperature of Boston, during a period of twenty-six years, has been estimated at 49° Fähr'enheit. That of Quebec during a series of years has been computed at 40°; Montreal', 44°; New York, 52°; Philadelphia, 52°; and Bâl'timore, 54°. That of Nör'folk is as high as 59°; Charleston, 66°; Savannah, 67°; and New Orleans, 67°. Key West, Florida, is 77½°, and is probably the warmest place in the United States; and Sän Diê'go ranks next, with a temperature of 72°. The climate in Sän Francîs'co is a little warmer than that of Baltimore, being 56°.

458. Catä'nia, in Sĭ'cily, is one of the warmest places in Europe; and, although five degrees north of Savannah, is equal to it in warmth and pleasantness of climate. At Paris the temperature is about the same as that of New York, although it is situated five degrees farther northward. Nā'ples and Rome are like Philadelphia and Cincinnä'ti. London, which is five degrees farther north than Bŏs'ton, experiences the same degrees of heat and cold. St. Petersburg has the same average temperature as Montreal; and Constantinople is the same as Norfolk. Jerusalem, in Palestine, and Nangasä'ki, in Japan, both occupy an intermediate rank between Norfolk and Charleston.

459. An insular or sea climate is uniform and moist; the sky is often cloudy and rainy in high latitudes. A land climate is *excessive*, with violent changes, and dry; the sky is usually clear.

460. All the waters of the continents are derived from the

Table.—457. Average of temperature in different places in the United States.—458. Comparison between American and European cities.—459. Peculiarity of a sea climate.—460. Source of the continental waters. Changes wrought sea. The sun, by his heating rays, causes the vapor to rise from their vast expanse of surface, ascending into the atmosphere, filling it with moisture. The colder air of the upper regions condenses the vapor, so that it becomes visible in the form of clouds and fogs, which, being borne along by the winds, pass over the lands, and fall in abundant rains. That which is not consumed in the nourishment of plants and animals, nor carried off into the atmosphere by evaporation, is returned to the ocean by springs and rivers.

461. Moisture, fertility, and vegetation depend upon the vapors which are thus carried by the winds from the ocean to the lands. The larger the tracts of land, and the more closely they are clustered together, the more difficult it is to receive these beneficial influences of the ocean. Hence we perceive the variety of circumstances on which climate is made to depend.

462. The causes which produce diversity of climate being so various, and great difference of temperature being found to prevail in similar parallels of latitude, no rule can be laid down relative to the climates on the earth's surface. It may, however, be considered that, generally speaking, the eastern districts of both the Old and New Continents possess more *excessive* climates than the western districts of either; that the climate in the interior of continents is most excessive; and that islands have a more equable, or less variable temperature than large masses of land.

---

upon the vapor by the atmosphere. — 461. For what influences are the continents dependent on the oceans? Circumstances limiting the extent of these influences. — 462. Summary remarks on climate.

CHAPTER XVII.

OF WINDS.

"The wind goeth toward the south, and turneth about unto the north; it whirleth about continually: and the wind returneth again according to his circuits." — *Eccl.* i. 6.

§ 1. GENERAL SYSTEM OF ATMOSPHERIC CIRCULATION.

463. THE winds that blow in our temperate regions are very variable. They suddenly change their direction, their force, and their temperature, without apparent cause; but in the equatorial regions, the winds are either constant or periodical. In the Pacific and Atlantic Oceans we find a gentle and regular wind blowing from east to west, with great constancy, from one end of the year to the other. In the Indian Ocean the winds blow five months from the N. E., and five months from the S. W., taking about a month for them to change and become settled.

464. There is a general system of atmospheric circulation, or interchange of air over the earth, chiefly caused by the light and heat of the sun, for the purpose of preserving a proper mixture and purity of the air in both hemispheres. Magnetism and electricity are also considered among the forces concerned in the circulation of the air.

465. At the point of greatest heat the air expands, thereby becoming lighter; and, being pressed by the surrounding air, which is colder and heavier, it *ascends*. Two currents are thus established, one ascending, creating a void which is immediately filled by the cold lateral current, pushing in from all sides. An island in the midst of the ocean will furnish an example. Land is heated more rapidly than the sea; and, as the sun rises above the horizon, the island

---

463. Winds of temperate regions. Of equatorial. Pacific and Atlantic between the topics. Alternate winds in the Indian Ocean. — 464. General system of atmospheric circulation. — 465. Effect upon the air at the point of greatest heat. Currents established. Example afforded by an island in the ocean.

becomes warmer than the encircling sea. The air resting on the land receives the heat, and ascends, the cooler sea air rushing in as a sea breeze. During the night it is the reverse. The island, losing its heat by radiation, cools sooner than the sea. Its atmosphere, having become heavier, flows into that of the sea as a land breeze, which continues till the temperature and density of the two atmospheres become equal.

466. The same process is going on between an entire continent and the ocean, from one season to another, between the tropical, temperate, and polar regions, in a permanent manner. The temperature between the tropics is nearly uniform, and is constantly higher than that of the polar regions; and to these differences of temperature particular currents of air correspond. — *Remark.* The direction of a wind is designated by the point of the compass from whence it comes, which is also called the windward; and the point towards which the wind is blowing is called the leeward.

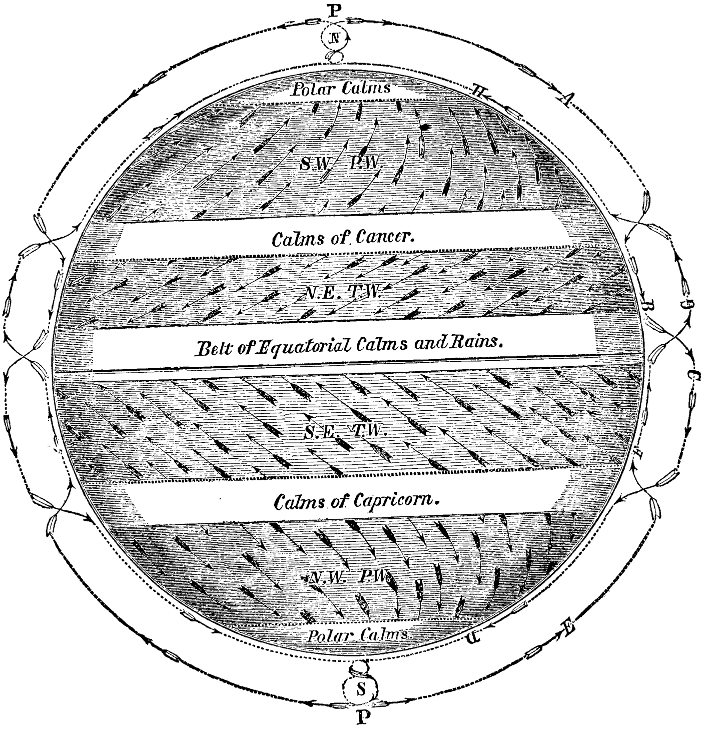
467. The rotation of the earth on its axis from west to east, together with the difference of motion between the poles and the equator, exerts an influence upon the direction of these currents, causing them to deviate more and more from their original direction. The current from the N. is changed into a current from the N. E., and that from the S. into a current from the S. E. These two currents meet near the equator, producing the *N. E. and S. E. trade winds.*

468. The general system of atmospheric circulation is thus described in the Bible: "The wind goeth toward the south, and turneth about unto the north; it whirleth about continually, and the wind returneth again to his circuits." — *Eccl.* i. 6. Tracing the general course of the "wind in his circuits," we find five zones of rest, in which calms and light airs are the prevalent condition of the atmosphere. The central one is near the equator, where the N. E. and S. E. trade winds meet, forming what is called the belt of equatorial calms.

469. Two other belts lie between those parallels where the "wind that goeth towards the south" meets that which "turneth about unto the north." They are the calms of Cancer and Capricorn.

Sea breeze. Land breeze. — 466. Application of this process to an entire continent. Temperature of the tropics. Mode of designating the direction of the winds. — 467. Influences acting upon these currents of air. Resulting winds. Place of their meeting. — 468. Bible description of atmospheric circulation. Zones of rest. Belt of equatorial calms. — 469. Calms of Cancer and Capri-

DIAGRAM OF THE WINDS.



EXPLANATION.

S. W.-P. W. — South-West Passage Winds.
N. E.-T. W. — North-East Trade Winds
S. E.-T. W. — South-East Trade Winds.
N. W.-P. W. — North-West Passage Winds.

470. The Cancer belt of calms in the Atlantic is known to American seamen as the "Horse Latitudes," from the circumstance that the vessels formerly engaged in carrying horses from New England to the West Indies found it so difficult to cross this belt. They would often be detained in the calms for many days, during which time the large cargo of horses would exhaust the stock of water, become frantic with thirst, and, to save a part, the rest would have to be thrown overboard.

471. The surface winds from the calms of Cancer approach the north pole by a series of spirals from the S. W., thereby creating a whirl in which the ascending column of air revolves from right to left, or *against* the hands of a watch. At the south pole the winds come from the N. W., and consequently they revolve about it *with* the hands of a watch. These spirals are the polar calms.

472. The N. E. and S. E. trades are surface winds. In the equatorial calms they have run their course on the surface, and are going up to blow as upper currents. The N. E. trade winds keep on towards the south as an upper current, and the S. E. trade winds make their way north. On reaching the region of the tropics they descend again to the surface, each holding its onward course: in these we have the prevailing S. W. passage winds of the *north*, and N. W. passage winds of the *south.*

473. "It may now be regarded as an established fact that there is a perpetual upper current of air from South America which falls at the belt of Cancer to North Africa — a fact which is proved by an examination of specimens of the "red fog," or "sea dust," from the region of the Cape de Vërdes, and from Mâl′ta, Gĕn′oa, Lȳ′ons, and the Tȳr′ol. This dust is found to consist of infusoria and organisms whose *habitat* [or native place] is not Africa, but South America, and in the region of the S. E. trade winds of South America." — [Lieut. Maury, U. S. N.]

EXPLANATION OF THE CHART OF THE WINDS.

The wind represented by the arrows A 1 2 3, in the southern hemisphere, as S. E. trades and monsoons, is supposed, when it meets the N. E. trades, to rise

---

corn. — 470. The "horse latitudes." — 471. Polar calms. — 472. N. E. and S. E. trade winds. The S. W. and N. W. passage winds. — 473. Proof of the up and flow to the northward and eastward as an *upper* current, until it passes the N. E. trade wind region. It then appears on the surface as the prevailing S. W. wind of the extra tropical regions of the northern hemisphere, as noted by the arrows A 1 2 3, to the north of the Tropic of Cancer.

The arrows at A 1, in the South Pacific, show where the *vapor* which feeds the Mississippi with rains is supposed to be taken up; and those of A 1, in North America, show where it is precipitated.

The arrows at C, in the North Pacific, show where the vapors that supply Chile and Western Patagonia are supposed to be taken up.

The arrows at A 2, in the northern hemisphere, represent the supposed route of the air in that region, which has passed over South America, at A 2, as the S. E. trades and the monsoons; and the arrows A 3, in the same region, are intended to indicate the route of the S. E. trades and monsoons of Africa.

474. The course of the winds as above described is represented in the *diagram* (page 159) by the arrows along the wavy curves A, B, C, D, to the south pole, thence up with the arrow at P, and around with the hands of a watch, and back as indicated by the arrows along E, F, G, and H.

475. The belt of equatorial calms has a mean average breadth of about six degrees of latitude. It always separates the two trade wind zones, and travels up and down with them during the year, coming farther north in the summer, where it tarries several months, and then returns. This belt moves over more than twice its breadth, and the entire motion from south to north is accomplished generally in two months, May and June. The whole system of zones, viz., of the trade winds, calms, and passage winds, follow the sun.

476. " In the region of equatorial calms and rains there is *a ring of cloud* that encircles the earth, which, by travelling with the calm belt up and down the earth, shifts the surface from which the heating rays of the sun are excluded. This cloud ring is stretched around our earth to regulate the quantity of precipitation in the rain belt beneath it; to preserve the due quantity of heat on the face of the earth; to adjust the winds; and send out for distribution to the four corners vapors in proper quantities to make up to each river basin, climate, and season its due share of sunshine, cloud, and moisture. The vapors which form this cloud ring come from the trade wind regions; under the cloud ring they rise up; as they rise up they expand; and as they expand they grow

---

origin and course of the S. W. passage winds. — 474. Reference to the *diagram of the winds*. — 475. Belt of equatorial calms. Breadth. Movement. Time. — 476. The "*cloud ring*." Its place. Purpose. Sources of vapor cool, and rain follows. By the rainy seasons of the torrid zone, we can trace this cloud-ring stretched like a girdle round about the earth." — [Maury.]

§ 2. Trade Winds and Monsoons.

477. The continents impede the progress of the trade winds, dividing the equatorial current into three regions. The trade winds of the Pacific are arrested by Asia and Australia; those of the Indian Ocean by Africa; and those of the Atlantic by America.

478. The Pacific trades begin at a certain distance from the W. coast of America, and blow almost without interruption as far as the coasts of Asia and Australia. The N. E. current is regular between 2° and 25° N. lat., and the S. E. current between 2° and 21° S. lat. The equatorial calms occupy the space between 2° N. and 2° S. of the equator. The air here is in an uncertain state of rest, which the least accident may violently disturb. A dead calm is often succeeded by sudden tempests, violent squalls, and tornadoes. Thunder and rain occur almost daily.

479. The Atlantic trades, on account of the nearer position of the continents, and the direction of the coasts, are farther north than the Pacific trades. The northern limit of the N. E. current is about 28° or 30° N. lat., and the southern limit of the same is about 8° N. lat. The belt of calms in the Atlantic occupies a space wholly north of the equator, so that the northern edge of the S. E. current is in the northern hemisphere.

480. Monsoons. — When a trade wind is turned back or diverted by overheated districts from its regular course at stated seasons of the year, it is regarded as a *monsoon*. Thus the African monsoons of the Atlantic, the monsoons of the Gulf of Mexico, and the Central American monsoons of the Pacific, are, for the most part, formed of the N. E. trade winds, which are turned back to restore the equilibrium which the overheated plains of Africa, Utah, Texas, and New Mexico have disturbed.

481. When the monsoons prevail for five months at a time, (for it takes about a month for them to change and become

---

Direction. — 477. Influence of the continents upon the trade winds. — 478. Trade winds of the Pacific. Equatorial calms. — 479. Trade winds of the Atlantic. Belt of calms. — 480. What are monsoons? African monsoons. Gulf of Mexico and Central American, how formed? — 481. South-west monsoons of

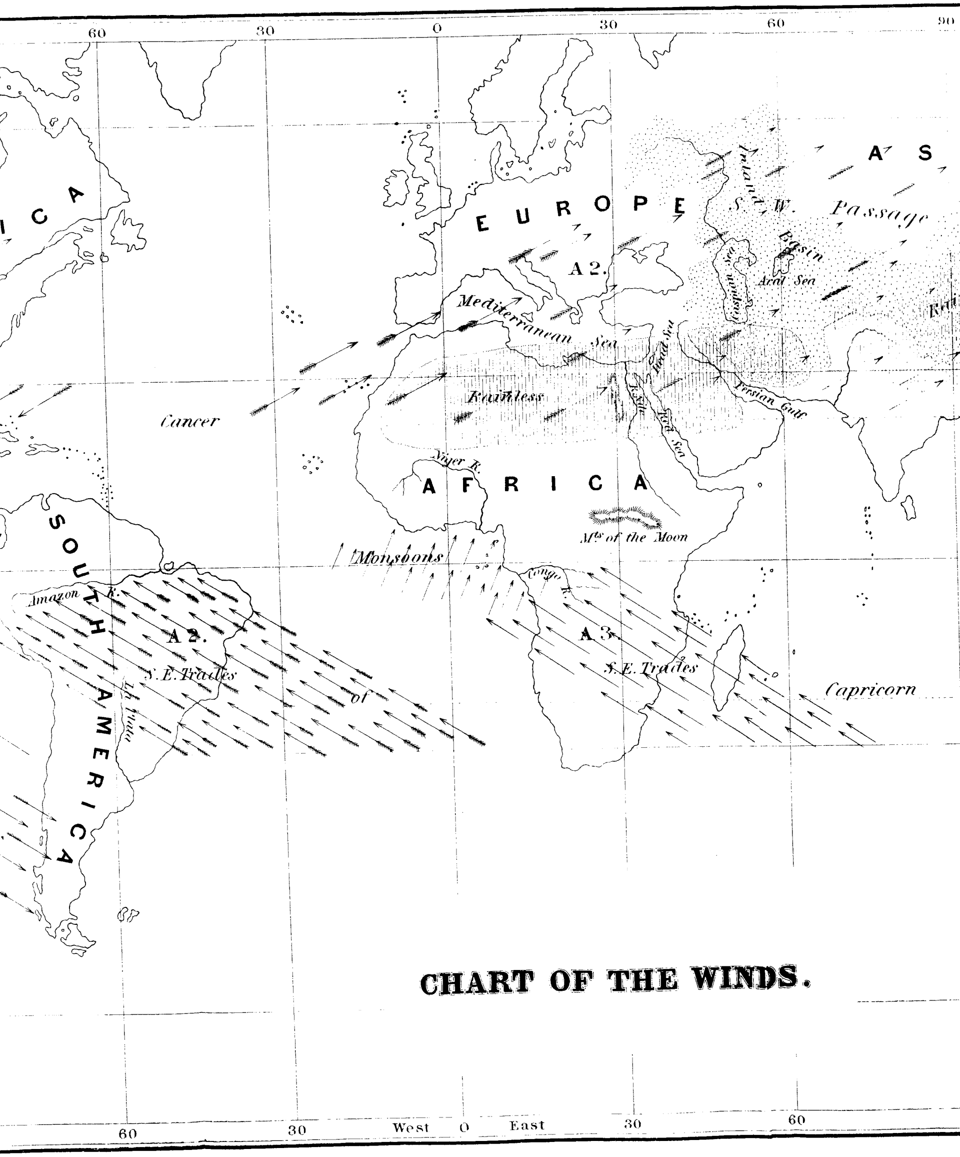


CHART OF THE WINDS.

settled,) then both they and the trade winds, of which they are formed, are called monsoons. The S. W. and N. E. monsoons of the Indian Ocean afford an example of this kind. The S. W. monsoons of the Indian Ocean blow from May to September inclusive. They are caused by the intense heat which the rays of a cloudless sun produce during the summer time upon the Desert of Cō′bi and the burning plains of Central Asia. When the sun is north of the equator, the force of his rays, beating down upon these wide and thirsty plains, causes the air to expand and ascend. There is, consequently, a rush of air, especially from towards the equator, to restore the equilibrium; and in this case the force which tends to draw the N. E. trade winds back becomes greater than the force which is acting to drive them forward.

482. When it is summer time in Africa south of the equator, the winds are blowing from the N. E., in obedience to the trade wind force, which prevails from November to March inclusive; hence we have the N. E. monsoons. The monsoon season may always be known by referring to the cause which produces these winds. Thus, by recollecting where the dry and overheated plains are, we know at once that these winds are rushing with greatest force towards these plains at the time of their hottest season of the year.

483. In the southern part of the Indian Ocean, which is not so much under the influence of the lands, the S. E. trade winds blow very regularly through the whole year. The seas of Southern China, being, by their position, under the influence both of the Pacific trade winds and the Indian monsoons, are subject to severe tempests and tȳphôôns′, which desolate those seas more than any other in the world.

484. Rain Winds are the winds which convey the vapor from the sea, where it is taken up, to other parts of the earth, where it is let down either as rain, snow, or hail. As a general rule, the trade winds may be regarded as the great evaporating winds; and when, in the course of their circuit, they become monsoons, or the variables of either hemisphere, they then generally become also the rain winds for certain localities. Thus the S. W. monsoons of the Indian Ocean are the rain winds for the west coast of India. In like man-

---

the Indian Ocean, how caused? — 482. North-east monsoons of the Indian Ocean. The monsoon season, how known? — 483. Wind of the *southern* part of the Indian Ocean. Typhoons. — 484. The rain winds. The evaporating ner, the African monsoons of the Atlantic are the winds which feed the springs of the Nī′ger and Sĕnegâl′ with rains.

§ 3. Winds of the Temperate and Polar Regions.

485. The temperate regions are marked by variable winds. Though the winds blow from every point of the compass in the course of a year, the S. W. and N. E. winds are the most prevalent in the northern hemisphere.

486. In the North Atlantic the S. W. passage winds prevail over the "easterly" winds in the ratio of about 2 to 1; so much so that the passage of packet ships from the United States to Europe is about one third shorter than the return passage. *The commercial pathway from America to Europe is north of the Gulf Stream*, on the arc of a great circle. These south-west winds originate in the S. E. trade winds, which, having passed up and over the N. E. trades as an upper current, descend to the surface at about 30° N. lat. They advance as far as the high latitudes of Norway, bathing all the western coasts of Europe in their soft and humid air.

487. The S. W. winds also prevail in the middle latitudes of the Pacific Ocean, extending to the western coasts of North America. The higher temperature of the western shores of the northern continents, compared with that of their eastern seaboards, is due, therefore, to the combined influence of these S. W. winds with the Gulf Stream in the Atlantic, and the China Stream in the Pacific.

488. The cold air of the polar regions is constantly flowing towards the warmer regions, partly as an upper current, according to the general law of atmospheric circulation, and partly as a surface wind: hence in the northern hemisphere we have a prevalence of N. E. winds. These winds, finding an open path in North America, from one end of the continent to the other, sweep from the borders of the Arctic Ocean as far as the Gulf of Mexico. They strike obliquely against the Rocky Mountains, run along their slopes, and, being reflected by this high chain, descend as a N. W. wind

---

winds. Rain winds for the west coast of India. West Africa. — 485. Winds of the temperate regions. — 486. Winds of the North Atlantic. Commercial pathway. Origin of these south-west winds. Their influence on Western Europe. — 487. The S. W. winds of the Pacific. Difference of temperature between the eastern and western shores of the northern continents. — 488. Of into the valley of the Mississippi, accompanied by cold and storms. Proceeding towards the Atlantic coast, they meet the S. W. or the equatorial winds.

489. This conflict between the polar and equatorial winds, so opposite in character and direction, gives to our climate one of its most remarkable features, — that of changeableness, — that great variety of temperature, of drought and of humidity, of fair weather and foul, which mark the seasons with uncertainty, and the labors of the husbandman with doubtful results.

490. It is to the prevalence of the S. W. winds that the river systems of Sibē′ria owe their supplies. These winds have brought their waters from the southern hemisphere, from the Mediterranean, and the Red Sea, to fertilize this otherwise barren waste. The valleys of the O′bi, the Yenisê′i, and the Lē′na attest the truth of this assertion.

---

the N. E. winds of the northern hemisphere. Course of the polar winds on the North American continent. — 489. Effects of the conflict of polar and equatorial winds. — 490. Influence of the S. W. winds upon Siberia.

CHAPTER XVIII.

OF RAIN.

"Thou visitest the earth and waterest it; thou greatly enrichest it with the river of God, which is full of water: thou preparest them corn, when thou hast so provided for it." — *Ps.* lxv. 9.

§ 1. GENERAL OBSERVATIONS.

491. THE winds, sweeping in all directions, carry with them into the places where they go the temperature and moisture of the regions from which they came. A sea breeze will always be moist, and relatively temperate. It is ordinarily the herald of rain. A land breeze is dry and extreme, whether in cold or heat, and generally presages fair weather. From every part of the land and water surface, and at all temperatures, moisture rises in an invisible form, called *vapor*, which mingles with the air. Evaporation goes on more rapidly when the air is in motion than when it is calm.

492. The tropical atmosphere contains a vast quantity of water as vapor. This is owing to the heat, which, being always very great, increases the capacity of the air for holding moisture. Even under the most serene sky the air is charged with vapor.

493. The greater part of the atmosphere rests on the ocean; the sea, therefore, has the chief influence in modifying climates and supplying the air with moisture. When air contains all the moisture it is capable of receiving, it is said to be saturated. If its temperature be raised, it will hold more; but if it be lowered, its capacity for vapor is diminished, and a part of the vapor will be condensed and deposited, or precipitated.

---

491. Of the winds as carriers. Sea breeze. Land breeze. Evaporation. Constant. When greatest. — 492. State of the tropical atmosphere with regard to vapor. — 493. Chief influence in modifying climates, &c. The air, when sat-

494. The prevailing winds of the temperate zones blow towards the poles; they are going from warmer to colder climates; consequently, their capacity for moisture decreases with their temperature, and they must let down more water than they can take up again. The prevailing winds of the torrid zone blow towards the equator; they are going from colder to warmer climates. Their capacity for moisture is therefore constantly on the increase, and they must evaporate from this zone more water than they precipitate upon it again.

495. When two currents of air of different temperature, moving rapidly towards each other, come in contact, a heavy fall of rain takes place, and at the same time a quantity of heat and electricity is disengaged, producing thunder and lightning. As the quantity of vapor is most abundant in tropical regions, the rains are heavier, and the drops are larger, than elsewhere.

496. If a wind charged with clouds flows into a warmer and drier atmosphere, its capacity for vapor is thereby increased, and instantly the clouds are dissipated. This is the case with winds blowing from the Mediterranean towards the Sahä'ra.

497. When moist winds come in contact with a high mountain chain, they are forced to ascend the slopes into a higher and colder atmosphere, which condenses the vapors. The rain flows down along the mountain sides, but the wind itself passes over the mountain ridge, cloudless and dry.

498. The mountain chains are *the great condensers* placed along the continents to receive the moisture of the winds, to serve as reservoirs for the rain waters, and to distribute them afterwards, as they are needed, over the neighboring plains. Every system of mountains becomes the centre of a system of irrigation invaluable to its adjacent lands. They receive more rain in the heights than on their sides, and more falls at their bases than in the neighboring plains. Mountain chains which run N. and S. have a dry and a rainy side; and the prevailing winds of the latitude determine which is the rainy and which is the dry side.

---

urated. Effects of raising and lowering the temperature. — 494. Courses of the winds of the temperate zones. Torrid zones. — 495. Meeting of two currents of air of different temperatures. Why are rains heavier in tropical regions? — 496. A wind charged with clouds flowing into a warmer and drier atmosphere. — 497. Moist winds in contact with a high mountain chain. — 498. Mountain chains the great condensers. Of what is every system of mountains a centre? Mountains running N. and S. — 499. *Excess* of precipi-

499. In some parts of the earth the precipitation is greater than the evaporation; this is shown by the amount of water carried by every river that runs into the sea, which is considered as the excess of precipitation over evaporation. In other parts of the earth, these operations are equal, as in those inland basins, such as that in which the city of Mexico, Lake Titicä'ca, and the Caspian Sea are situated. In other parts still, we find places, as the Desert of Sahä'ra, in which neither evaporation nor precipitation takes place, and in which we find neither plant nor animal.

§ 2. Of Clouds.

500. The Region of Clouds is at a height varying from one to four miles above the earth's surface. The different currents of air in the lower portions of the cloud region run horizontally on each other; and as they generally differ in moisture, temperature, and motion, the colder condense the vapor of the warmer, and make it visible in the form of *cloud.* At moderate heights clouds consist of water; but at great elevations they are an assemblage of minute crystals of ice. Clouds are most frequently higher within the tropics than in the temperate zones; and in the latter, they are commonly higher in summer than in winter. The denser clouds are usually formed towards noon, when the vapors are raised up by the ascending currents of air. Notwithstanding the varied forms of clouds, they may be classified under a few principal types. There are three primary forms, viz.: the Cirrus, the Cumulus, and the Stratus.

501. The *Cirrus* is the highest. It sometimes resembles a white brush, at others it consists of horizontal bands of slender silvery filaments. The height of the cirrus is calculated at 19,500 feet, and is made up of minute particles of ice or snow flakes. Among these clouds, which sometimes appear like fleecy cotton, halos and mock suns are formed, which often precede a change of weather, announcing rain in summer, and frost and snow in winter.

502. The *Cumulus*, or summer cloud, presents itself in the form of a vast heap of vapors resting on a horizontal base;

---

tation over evaporation, how shown? Equal. Neither. — 500. Height of the region of clouds. Formation of clouds. Clouds at moderate heights. At great elevations. Clouds within the tropics. In summer and winter. Denser clouds, when formed? Primary forms of clouds. — 501. The cirrus. — 502. The hence its name, cumulus, a heap, or pile. It is called the summer-day cloud, from its frequent occurrence at that period, resembling a mountain of snow when lighted up by the beams of the sun. It usually begins to form early in the morning, enlarges as the day advances, attains its greatest magnitūde in the hottest part of the day, decreases as the sun declines, and breaks up towards sunset.

503. The *Stratus*, or fall cloud, consists of horizontal bands near the surface of the earth. It belongs to the night, forming at sunset and disappearing at sunrise.

504. Besides these primary varieties, four secondary forms occur. The *Cirro-cumulus* is a feathery, accumulated cloud, familiarly known as fleecy, consisting of small, rounded patches, arranged in extensive beds, the parts being quite distinct.

505. The *Cirro-stratus* consists of bands of filaments more compacted than those of the former, lying inclined, or disposed in horizontal strā′ta. It is sometimes seen cutting the disk of the sun or moon with a dark line.

506. The *Cumulo-stratus*, or twain cloud, is formed of two or more cumuli united together, and resting on a common stratum. This is the most magnificent variety, which often exhibits a copper tinge, indicating a highly electrical condition of the atmosphere, and precedes the thunder storm.

507. The *Nimbus*, or rain cloud. Any of the preceding modifications may pass over into the actual rainy cloud, first exhibiting a great increase of density, and a bluish-black tone of color, then putting on a lighter shade, or gray obscurity, and becoming fringed at the edges.

508. Among the various offices which the clouds perform, we find them moderating the extremes of heat and cold, and mitigating climates. At one time they spread themselves out, "covering the earth as with a mantle," thereby preventing radiation from its surface, and keeping it warm. At another time, they interpose between the earth and the sun, and screen it from his scorching rays, to protect the tender plants from his too potent heat, the land from drought.

509. When the condensation of vapor takes place at a considerable height in the atmosphere, or in very cold strata of air, the drops descend in the form of hail or snow. If the congelation of moisture takes place slowly, Snow is formed;

---

cumulus. — 503. The stratus. Secondary forms. — 504. The cirro-cumulus.— 505. The cirro-stratus. — 506. The cumulo-stratus. — 507. The nimbus. — 508. Remark on the offices of clouds. — 509. Of hail. — 510. Of fogs. — 511. Of whilst HAIL appears to be produced suddenly by intense cold in the upper regions. Hail, therefore, frequently occurs in summer, and in hot climates where snow is unknown.

510. FOGS and MISTS are formed from the vapors just rising from warm and moist ground, or the surface of water, and coming in contact with air colder than itself. They are, therefore, more frequent in autumn and at the approach of cold weather, than in spring; and as the temperature of the sea is often higher than that of the atmosphere, they are by no means uncommon on the ocean, more particularly in cold climates, and are very frequent in the polar regions. A remarkable stationary fog occurs off the coast of Newfoundland, which owes its origin to the chilly atmosphere of that station, and the comparative warmth of the waters of the adjacent ocean.

511. DEW is formed when air containing an excess of moisture comes in contact with a surface in a certain degree colder than itself. It is found to be deposited on different substances unequally, and in proportion to their powers of radiation, more on vegetables than on dry sand, and very little on bright metallic surfaces. The deposition of dew will be greatest when a clear, cool evening succeeds a sultry day; little or no dew is formed if the sky be veiled in clouds. *Frost* is merely the ice of dew, as hail is the ice of rain.

512. In the northern hemisphere, the land and water are nearly equally divided, but in the southern hemisphere there is far more water than land. All the great rivers in the world are in the northern hemisphere, excepting the Amazon, which belongs to both, and the Rî'o de lä Plä'ta, which is in the southern; but *the chief evaporating surface* is in the southern hemisphere. Late in the autumn, throughout the winter, and in early spring, the sun is pouring his rays with the greatest intensity down upon the seas of the southern hemisphere, and, like a powerful engine, is pumping up water for our rivers.

513. The heat which this heavy evaporation absorbs becomes latent, and with the moisture is carried through the upper regions of the atmosphere until it reaches our climates. Here the vapor is formed into clouds, condensed, and precipitated in rains, snow, and hail. The heat which held this water in a state of vapor is set free, and it is that

---

dew. Frost. — 512. Relative quantity of land and water in the northern and southern hemispheres. Hemisphere of great rivers. Hemisphere of evaporating surface. Region and season of intense action of the sun on the ocean. — 513. Latent heat. What tempers our winter climate? — 514. Evaporation and which contributes so much to temper our winter climate. If in winter it clouds up and turns warm, we say we are going to have "falling weather."

514. While evaporation is going on with the most activity in the southern hemisphere, precipitation is taking place to the greatest extent in the northern. The "fall spell," the "winter rains," and the "long season in May," are familiar terms of wet weather to us all.

§ 3. Periodical and Continuous Rains.

515. The earth, with regard to the distribution of the rains over its surface, is divided into two great zones; namely, that of periodical rains, which are in the tropical regions, and that of continuous rains, which are in the temperate regions.

516. Rains are distributed very unequally over the earth, diminishing in quantity from the equator towards the poles. They are more abundant in the western than in the eastern hemisphere. The annual fall of rain in tropical America is 115 inches, while in the Old World it is only 76 inches. In the temperate zone of the United States the annual quantity is 37 inches, while on the eastern continent it is but 31$\frac{3}{4}$ inches.

517. Within the tropics the rains follow the course of the sun. They prevail in the northern tropic when the sun is north of the equator, and in the southern tropic when it is south of the equator. Hence the year is divided into seasons, distinguished as the wet and the dry.

518. As the sun passes and repasses from one tropic to the other, there are in most intermediate places two rainy seasons; one when the sun passes the zenith of a place in his progress towards the northern tropic, and the other at his return.

519. The rain does not fall continually during the rainy season between the tropics, for the sky is generally clear at sunrise. At 10 o'clock A. M. it begins to cloud up; at noon the rain commences, and after pouring four or five hours, the clouds vanish at sunset, not a drop falling in the night.

520. In the regions of the monsoons the course of the rains depends entirely upon them. All the western coasts

---

precipitation at opposite points. Of familiar terms. — 515. Division of the earth with regard to rains. — 516. Distribution of rains. Annual fall of rain in America. In the Old World. — 517. Rain within the tropics. Seasons. — 518. Places subject to two rainy seasons a year. — 519. Peculiarity within the tropics. — 520. Rains in the regions of the monsoons. — 521. Opposite conare watered during the S. W. monsoons, and the eastern coasts during the N. E. monsoon.

521. The S. W. winds lose their vapor on the summit of the Ghâuts Mountains, and violent rains fall daily on the Malabär′ coast, while on the Coromăn′del coast the sky is serene. The contrary takes place during the N .E. monsoon. The plateau of the Dĕc′can between partakes of both characters.

522. The rains of the temperate regions present a contrast to that of the tropics. Here we have the *continuous rains.* They fall in smaller quantity, and are more uniformly distributed through the whole course of the year. As we leave the tropics their periodical character disappears. North of the tropics we find the winter rains, as at Madeira and Lisbon. Still farther north are the spring and autumnal rains, as in Italy and some portion of the Mediterranean. In Germany they have the summer rains. The general character of the rains of these regions, though caused mainly by the meeting of the S. W. winds with the north-easters, appears to depend on the influence of many geographical features.

523. " It would be interesting, in this connection, to inquire why the deserts of the Old World are placed just *where* they are, and *as* they are; and why those inland seas of Europe and Asia—the Mediterranean, the Red Sea, the Persian Gulf, the Black and Caspian Seas—are placed in a S. W. and N. E. range."

524. The S. W. trade winds, after ascending in the equatorial calms with their load of vapor, whether great or small, take a N. E. direction because of the earth's diurnal motion, and they continue to flow in that direction, in the upper regions of the air, until they cross the tropic of Cancer.

525. Those winds which have passed over the ocean surface, and risen up at the equator before reaching the southern continents, carry immense volumes of water into the northern hemisphere, supplying the basins of the Mississippi and the great system of fresh water lakes in North America, the Rhine, the Elbe, and all the great rivers of Europe that flow into the Atlantic, and in Asia the Ganges and all the great rivers of China.

526. Those winds which have blown their course over

---

dition of the Malabar and Coromandel coasts. Of the Deccan.—522. Rains of the temperate regions. Successive changes in leaving the tropics. Their general character, dependent on what?—523. Interesting inquiry.—524. Course of the S. W. trades after ascending in the zone of calms.—525. State of those winds that have passed over the ocean. Their effects.—526. State of

South America and Southern Africa leave much of their vapor behind to feed the sources of the Amazon, the Nī′ḡer, and the Cŏn′go; consequently, they arrive in the northern hemisphere as dry and thirsty S. W. winds, and, taking their route through Europe and Asia, along the range of those inland seas, they take up their waters and bear them off to distant regions, making lands fruitful which otherwise would be barren wastes. "Hence we perceive that these sheets of water were placed where they are, and as they are, by the almighty hand, *to balance the land* in the trade wind region of South America and Africa." — [Maury.]

527. The quantity of rain decreases in ascending from the plains to the table lands, especially if they are edged by mountains, because the mountains condense the vapor before it arrives at the high plains. On the contrary, the quantity increases in ascending to the tops of rugged mountains, on account of partial currents of air which condense the moisture into clouds. The quantity of rain decreases from the coasts into the interior of the continents, because more vapor rises from the sea than from the land. The vapor from the Gulf Stream produces a greater quantity of rain and fog in the southern counties of England and Ireland than in other parts of those islands.

528. There are vast tracts of country on which rain never falls, and there are places where it rains only at long intervals and in small quantities. The most extensive rainless district is in the eastern continent, and reaches from the borders of Morŏc′co, eastward through Sahä′ra, over the Red Sea, the low coasts of Arā′bia, Pĕr′sia, and part of Beloochistăn′. The Desert of Cō′bi, on the oriental plateau, and part of Mongō′lia form another rainless district of the Old World. In the western continent, the table land of Mexico, part of Guatemä′la, and the western declivity of the Peruvian Andes, comprise the rainless districts.

529. Each continent depends for its rains and the tempering of its climates upon the particular disposition of its mountain chains, its plateaus, plains, and inland seas, with regard to the maritime winds.

---

those which blow over South America and Southern Africa. Their effects. Purpose of the inland seas of Europe and Asia. — 527. Quantity of rain in ascending from the plains to the table lands. In ascending to the tops of rugged mountains. In receding from the coasts to the interior of a continent. Effects of the Gulf Stream on the south of England and Ireland. — 528. Rainless tracts, &c. Rainless districts of the eastern continent. Of the western continent. — 529. On what does each climate depend for its rains and climates? — 530,

§ 4. Rains of the Western Hemisphere.

530. South America, from its tropical situation, secures a copious supply of moisture. The calm and trade wind belts move up and down the earth, annually, in latitude nearly a thousand miles. In July and August the zone of equatorial calms is between 7° N. and 12° N., and in March and April between 5° S. and 2° N. The eastern plains of South America are open to the trade winds of the Atlantic, which sweep over them, bearing along the vapors of the ocean.

531. The Brazĭl′ian and Parī′ma Mountains are too low to arrest the progress of these winds; they therefore serve to increase the falling showers and to furnish a more complete irrigation, in supplying such rivers as the Orinō′co, the lower tributaries of the Amazon, the Tocantīns′, and the St. Francĭs′co.

532. The crest of the Andes, rising into the region of perpetual snow, forms a complete barrier to all moist winds from the east. Here they accumulate and condense, pouring their waters down the eastern slopes. All this tract of country at the eastern foot of the Andes is one of the best watered on the globe, giving rise to the Amazon, the Ucayä′le, the Pû′rus, the Madêi′ra, and many others.

533. The western slope of the Andes presents a different condition of things. Neither the trade winds nor their vapors arrive there. The coast from the equator to Chī′le is seldom refreshed by the rains of the ocean. Hence opposite climates exist on opposite sides of the Andes. In one there is the richest vegetation; in the other there is drought, a parched soil, and thinly-scattered vegetation.

534. In the west of New Grenä′da this effect of the Andes is neutralized, both by the depression of the chain towards the north, allowing the trade wind to pass round it and reach the western side, and by its being situated in the zone of calms, affording almost daily storms of rain.

535. The southern coast of Chī′le, in winter, is left within the regions of the N. W. winds, — those which are counter to the S. E. trades, — and being cooled by the winter temperature of the highlands of Chī′le, deposit their moisture copiously. During the remainder of the year the greater part

---

Rains of South America. — 531. Effect of the Brazilian and Parima Mountains. — 532. Of the Andes. Remark on the country at the eastern foot of the Andes. — 533. At the western slope of the Andes. Of the opposite sides. — 534. Of the Andes in the west of New Grenada. — 535. Rains in Chile. — 536. In Oregon of Chi′le is in the region of the S. E. trades, when it is the dry season there.

536. In Or′egon and Washington it rains every month, but more in the winter months. The winter there is the summer of the southern hemisphere. The vapor that is taken up by the S. E. trades is borne along over the region of the N. E. trades to latitude 35° or 40° N., where it descends and appears on the surface with the S. W. winds of those latitudes. Driving upon the highlands of the continent, this vapor is condensed and precipitated, during this part of the year, in almost constant showers; and reaching beyond the Rocky Mountains, it supplies the sources of the Missôu′ri, Missis-sĭp′pi, and the great lakes. In Rŭs′sian America, where the S. W. winds strike the coast, there are continuous and copious rains, a temperate, equal climate, and a vegetation like that of the coasts of Scotland and Norway.

537. In winter and spring the S. W. winds, backing down to the south, reach as far down as the lower part of California. At this season the land there is cooler than the sea air, and is quite cold enough to extract moisture from it. But in summer and autumn the land is warmer than the sea airs, and therefore cannot condense the vapor of the air. So the same cause which made it rain in Or′egon now makes it rain in California.

538. As the sun returns to the north the calm and trade wind belts follow him; and now, at places where six months before the S. W. winds were prevailing, the N. E. trades are found to blow. This is the case in California. The prevailing winds, then, instead of going from a warmer to a cooler climate, as before, are going in the opposite way. Consequently no moisture can be precipitated under such circumstances.

539. Panamä′ is in the region which is traversed by the equatorial calms. Where these calms are it is always rainy. They are over the latitude of Panamä′ from June to November, which is the rainy season. The rest of the year that place is in the region of the N. E. trades, which, before they arrive there, must cross the mountains of the isthmus, on whose cool tops they leave their moisture, rendering Panamä′ dry and pleasant. Between the tropics, west of the plateau of Mexico, where the N. E. trades do not come,

---

and Washington. East of the Rocky Mountains. In Russian America.—537. Winter and spring in California. Summer and autumn.—538. The sun with the calm and trade wind belts.—539. The wet and dry seasons at Panathere is drought, as in Perú′. On the high table lands of California very little rain falls.

540. There are few physical evils which may not be palliated by judicious forethought; and even a drought, although it may seem to be a visitation of Providence, and an evil which cannot be provided against, because man cannot control the elements, may be remedied by the application of mind to inert matter. It is an old French maxim, and a true one, that "God aids those who aid themselves;" and instead of sitting down to bewail his losses by the drought, and blaming Nature for her partial distribution of the "gentle rain from heaven," the farmer would do well to consider how a like misfortune may be averted in the future. In a recent "Patent Office Report" we find the following: —

541. "The farms in the United States contain over 300,000,000 acres, on every square foot of which there falls an average of 200 pounds of water, or more, per annum. Wisely husbanded, this immense quantity of rain water may render the farmers and gardeners a vastly greater service than it now does. Skilful engineering has yet to be applied to American agriculture, with a view to make the most of steam power, water, fuel, earth, rocks, air, sunshine, and vegetable and animal vitality."

§ 5. Rains of the Eastern Hemisphere.

542. **Africa** presents two regions very unequally supplied with rains. North of the equator the lands are less consolidated: the plateaus are separated from each other. From Cape Guardafuî′ to Zanguebär′ the coast is but slightly elevated; the trade winds of the Indian Ocean penetrate inland. The coasts of Senegambia and of Guĭn′ea are in the region of calms; hence their copious rains, their moist and fruitful climate.

543. South of the equator the plateaus are continuous; but the uplands, instead of being in the west, as in America, are along the eastern margin. The Lupä′ta chain is, probably, the most elevated part of this continent.

544. The eastern coast, then, arrests the vapors, and the rains are abundant from Cape Guardafuî′ to the Cape of

---

ma. Rainless tract in Mexico, &c. — 540. Palliation of physical evils. French maxim. — 541. Remarks on irrigation. — 542. Africa north of the equator. Rains. — 543. Africa south of the equator. — 544. Natural consequence of

Good Hope; while the vast elevated plains stretching westward from the Lupä′ta Mountains to the coasts of Cŏn′go exhibit, so far as known, only sterility and drought, under the same latitude where South America is drenched by heavy rains.

545. The Sahä′ra, in the north, is closed against the access of the winds towards the east; while its position under the tropic, and the nature of its soil, cause that deficiency of rain which renders it the most extensive desert in the world.

546. Western Europe is open to the S. W. winds of the Atlantic, which bring their moisture all the year. The limited extent of its surface, together with its deep indentations by many inland seas and bays, secure to it continued rains, a mild climate, and a comparatively high temperature.

547. The Alps form a vast semicircle on the north of Italy, which receive the warm and moist winds coming from the Mediterranean and the ocean. Before passing this crest these winds lose their vapor, which falls in copious rain on all the southern slope.

548. The Ap′ennines produce similar results. They form an arch, which is marked by the curve of the Gulf of Gĕn′oa and the valley of the Ar′no. The summits arrest the sea winds, and the fall of rains at their southern foot is in far greater quantity than that of the northern declivity in the plains south of the Po.

549. The length and height of the Scandinā′vian chain, and its lofty frozen table lands, present an insurmountable barrier to the vapors brought to the coast of Norway by the S. W. winds from the Atlantic. They are condensed almost entirely upon the Norwē′gian shores, which are constantly enveloped in drizzling fogs. The temperature of this wind, together with the heat set free by so active a condensation of vapor, affords the remarkably soft and equable climate by which it is distinguished. The same wind brings clear and cold weather to the southern and eastern coasts of Sweden.

550. In Southern Asia the rains are regulated by the monsoons and mountain ranges. The rainy seasons of Hindostăn′ are reversed on its two coasts, while on the plateau of the Dĕc′can the rains are reduced to a small quantity.

---

this disposition of the lands. — 545. Why is the Sahara destitute of rain? — 546. Nature and causes of the climate of Western Europe. — 547. Position of the Alps with regard to moisture. — 548. Position of the Apennines. — 549. Highlands of Scandinavia. Effects produced by the S. W. winds from the Atlantic in Norway and in Sweden. — 550. Regulation of the rains in Southern

551. The region of In′do-Chī′na, and of the Asiatic Archipĕl′ago, is one of the best watered portions in the world, the causes of which are found in the conflict of the winds, the variety of lands, and the want of a continuous mountain chain.

552. The majestic chain of the Himalaȳ′a, the most massive and lofty on the globe, separates Southern Asia from the great body of the continent, and stops the course of the ocean winds. These winds, in passing over the plains of the Găn′ges, lose their moisture on the southern slopes of the Himalaȳ′a, fertilizing the inland valleys, and supporting a most profuse vegetation up to the snow line. But beyond the table lands are deprived of this beneficial influence; and towards the interior we find the Desert of Cō′bi and the sandy plains of Tôôrkistăn′, the rainless tracts of Asia.

553. In Australia the highlands are on the eastern border, as in Africa. The southern tropic divides the continent into two parts, and in the southern portion are situated the Australian Alps. The trade winds of the Pacific scarcely penetrate the interior, and the wind of the temperate regions shuns the coast. The interior of Australia is, therefore, believed to be a desert.

§ 6. Summary.

554. The several continents, with regard to the circumstances of moisture and dryness, may be noted as follows: North America is the best watered of the temperate continents; the rains are equally distributed. South America is the most humid of the tropical continents. Europe combines the moisture of the maritime climate with a great variety of contrasts; but they are all softened. Asia and Africa present the absolute contrast of dry and moist, in the zone of deserts touching upon the regions bathed by the rains of the tropics. Temperate Asia is the driest of the northern continents; and Australia is the driest and poorest of all the continents.

555. The western continent is one of plains, and the plains are open to the sea winds. Its continental forms are less piled up and massive. The eastern continent is that of plateaus, and of vast extents: it is also the driest.

Asia. — 551. Of Indo-China and the Asiatic Archipelago. — 552. Of the disposition of the Himalaya Mountains. The ocean winds on the southern slopes of the Himalaya. On the northern side. — 553. Highlands of Australia. Their effects. — 554. Points for recapitulation. North America. South America. Europe. Asia and Africa. Temperate Asia. Australia. — 555. Western continent. The eastern continent.

CHAPTER XIX.

OF OCEAN CURRENTS.

"Hast thou entered into the springs of the sea? or hast thou walked in the search of the depth?" — *Job* xxxviii. 16.

§ 1. GENERAL OBSERVATIONS.

556. THE ocean is every where in motion. Here, as in all other departments of nature, absolute rest is unknown. From whatever part of the ocean a current is found to run, to the same part a current of equal volume is obliged to return. This is as true of the air as of the water of the globe. The force of the wind, the attraction of the sun and moon, the atmospheric pressure, the differences of temperature, and the differences of saltness, are all considered as causes of motion in the waters of the great ocean.

557. WAVES. — The winds raise the waves of the sea by a mechanical action, producing only an agitation of its surface. The agitation at first extends little below the surface, but in long-continued gales even the deep water is troubled. The highest waves known are those which occur during the N. W. gales off the Cape of Good Hope, and the highest waves here do not probably exceed 40 feet from the hollow trough to the summit. When the winds blow constantly in one direction, they cause a transfer of the surface water.

558. TIDES. — The great mass of ocean waters is attracted by the sun and moon, causing the tides. The height to which the tides rise depends upon the relative positions of the sun and moon, upon their declination and distance from the earth, but more upon local circumstances. The spring tides happen at new and full moon; consequently twice in each lunar month, because in both cases the sun and moon are in the same meridian. For when the moon is new they are in

---

556. Condition of the ocean. Law of currents. Causes of motion in the waters of the ocean. — 557. Of waves. Highest known. Transfer of water. — 558. Of tides. Spring tides. Neap tides. Time of tides. — 559. The moon's

conjunction, (that is, both on the same side of the earth,) and when she is full they are in opposition; and in each of these positions their force is combined to raise the water to its greatest height. On the contrary, the neap or lowest tides happen when the moon is in her quarters, or 90° from the sun, for then they counteract each other's attraction to a certain degree. The tides ordinarily happen twice in 24 hours, because the rotation of the globe brings the same point of the ocean twice under the moon's meridian.

559. The moon produces another important effect on the earth, which may be mentioned here, and that is, the light it affords during the absence of the sun — an effect peculiarly important in the regions near the poles. Two very beautiful results arise: one is, that when the moon is full it comes to the meridian at midnight, so as to distribute its light equally over the hours of darkness; the other is, that coming to the full when it is in the opposite side of the heavens from the sun, it comes to the full in midwinter, when it is nearly in the same place in the heavens in which the sun is at midsummer, that is, when he rises highest and remains longest above the horizon. It thus affords the greatest portion of light when it is most needed.

560. OTHER CAUSES OF MARINE CURRENTS. — The unequal pressure of the atmosphere on different points of the ocean, causing differences of level, and above all the differences of temperature between the tropical and polar seas, together with the effects produced by the salts of the sea upon the density of waters, are so many more causes which operate to disturb the repose of the ocean.

561. The greater part of these causes often act together to produce the marine currents; but the difference of temperature between the equatorial and polar regions seems, by its agency manifested in evaporation, condensation, and precipitation of the rains, and the constancy of its action, to control all the rest.

562. There is a similarity, and in some cases a remarkable coincidence, between the great atmospheric currents and the general marine currents. Not only do the winds act directly upon the waters, sweeping them onward in their course, but the same forces drive them both in a common direction; the same obstacles — the continents — check their onward movement, and compel them to change their original route.

---

light. — 560. Other causes which disturb the repose of the ocean. — 561. Action of these causes. Chief controlling power. — 562. Similarity and coincidence of

563. The great equatorial current seems to be a general transfer movement of the tropical waters from east to west all round the globe. It is owing to the difference of temperature between the tropical and polar seas. The colder and heavier waters of the polar regions perpetually tend towards the warmer and lighter waters of the equator, and to displace them. The existence of these polar currents is proved by the floating masses of ice, which every spring stray towards the warm regions.

564. The equatorial current is arrested in its progress by the continents, causing the waters to flow back in very different directions. Each of the three great oceans forms a separate basin, in which various circumstances combine to modify the oceanic currents in a peculiar manner.

565. The Pacific Ocean, owing to its vast extent, affords greater scope to the general currents in a more regular manner than either of the others; but yet there is a harmony of arrangement pervading all. Every drop of water in the sea is as obedient to law and order as are the planets of the solar system. There are regular and certain channels through which the water travels from one part of the ocean to another, and those channels make the system of oceanic circulation as complete, as perfect, and as harmonious, as is that of the atmosphere.

§ 2. The South Polar Current.

566. This ice-bearing current, turned eastward by the prevailing winds of these regions, strikes the western coast of South America between 50° and 40° S. lat. It divides into two branches. One branch runs southward, doubling Cape Horn, and carrying its waters into the Atlantic.

567. The other and chief branch, known as Hŭm′boldt's current, passes along the coast of Chî′le and Perû′, cooling the climate by the low temperature of its waters, which are from 18° to 22° Fähr′enheit colder than the neighboring sea off Lî′ma. This current suddenly quits the coast near the promontory of Cape Blän′co, and goes on to form the grand equatorial current.

---

the currents of air and ocean. — 563. What is the great equatorial current? Its cause? Proof of the polar currents. — 564. Obstacles to the progress of the equatorial current. The basin of the oceans. — 565. Peculiarity of the Pacific Ocean. The seas all obedient to law and order. — 566. The south polar current. Two branches. First. — 567. Second or chief branch. Humboldt's

§ 3. The Grand Equatorial Current.

568. This current occupies a breadth of nearly 50 degrees, extending beyond the tropics north and south. It keeps an unobstructed course westward with a speed of 30 to 35 miles a day, reaching the islands that skirt the continents of Asia and Australia. On the north it reaches Formō′sa, and running upon the coast of Chī′na, turns off to the N. E. along the shores of Japăn′. On the south it is disturbed by the monsoons, and loses its way amidst the maze of islands, whose seas are thereby rendered dangerous to navigation.

569. In the North Pacific the west winds cause a drift current, which advances to the American coast, and conducts the waters southward along the shores of California, again to mingle with the general current. At Bēhr′ing's Straits the depth is insufficient to allow much under-current from the Arctic Ocean to enter the Pacific, while the warmer waters are constantly flowing through this passage into the Polar Sea.

570. Currents of the Indian Ocean. — Several active currents have their beginning in this sea, and carry from it volumes of overheated water. The waters here are hotter than those of the Caribbean Sea, and the evaporation is greater. One of these is the Mozambîque′ current, called at the Cape of Good Hope the Agŭl′has current. Another passes through the Straits of Malăc′ca, and being joined by other warm streams from the Jä′va and Chī′na Seas, flows out into the Pacific between the Philĭp′pines and the shores of Asia. Thence it takes the great circle route for the Aleū′tian Islands, tempering climates, and losing itself in the sea on its route to the coast of America. Midway between Africa and Australia, another current at times flows south from the Indian Ocean. To supply the waste created by these warm currents, as well as that caused by evaporation, there must be immense volumes of water flowing into the Indian Ocean.

571. The current in the channel of Mozambîque′ acquires a speed of four or five miles an hour, and, reënforced by another branch south of Madagăs′car, reaches in its rapid course the Cape of Good Hope and the Agŭl′has Bank, following the borders of it at a distance from the coast, when

---

current — 568. Grand equatorial current. Northern limit and course. Southern. — 569. North Pacific. Drift current. At Behring's Strait. — 570. Currents of the Indian Ocean. Temperature and evaporation. Mozambique current. Straits of Malacca. Route from the Philippines. Current setting *south* from the Indian Ocean. — 571. The Mozambique current. Its course onward. Curit divides. One branch meets the current setting from the South Atlantic, and with it reënters the Indian Ocean; the other branch doubles the Cape of Good Hope, enters the Atlantic, and flowing along the western coast of Africa, unites its waters with those of the great current of this third ocean.

572. The form of the Atlantic basin, its small breadth in the region of the equator, the jutting in and out of the shore line, as at Cape St. Rōque and the Gulf of Guĭn′ea, the deep windings of the Caribbē′an Sea and Gulf of Mexico, wherein nearly all the tropical waters of this ocean are accumulated, give to its currents a marked and unusual aspect.

573. The equatorial current does not assume its customary proportions in the Atlantic, while the return current, the Gulf Stream, is exhibited in a remarkable manner. Leaving the coasts of Southern Africa, the equatorial current soon extends both sides of the line, widens considerably, and flows across the ocean at the rate of two or three miles an hour.

574. At Cape St. Rōque it divides into two branches. One part, flowing southward along the Brazĭl′ian coast, mingles with the waters of the southern basin, and tempers the climate of Eastern Patagō′nia and the Fâlk′land Isles. The other and chief branch takes a direction along the shores of Guiä′na, one part moving on eastward of the Windward Islands, and another portion, entering the Caribbē′an Sea, passes through the Channel of Yucatăn′ into the Gulf of Mexico. After making the circuit of the gulf, it flows through the Straits of Florida, and comes forth as,—

§ 4. THE GULF STREAM.

575. The Gulf Stream, one of the most marvellous phenomena of the ocean, pours its warm waters over the Bahā′ma Banks, and flows along the coast of Florida, through a bed of cold water, which cold water performs to the warm the office of banks to a river. The depth of the Florida Pass has been ascertained to be 500 fathoms; the depth of the warm waters of the stream there is assumed to be 200 fathoms.

576. The velocity of the current varies in the "Narrows" from 2 to 5 miles an hour, according to the season, and at a

---

rent reëntering the Indian Ocean. Branch doubling Cape of Good Hope.—572. Why do the Atlantic currents bear a marked and unusual aspect?—573. Remark on the equatorial current of the Atlantic. Its course and rate.—574. Division at Cape St. Roque. South branch. Northern branch.—575. The Gulf Stream. Its bed. Depth at Florida Pass.—576. Velocity of the stream.

temperature of nearly 86° Fähr′enheit. It holds its course parallel to the shore, and at a short distance from it, until it passes beyond Cape Hăt′teras. At this point it meets the cold waters from the north, and the sand banks running along at a distance from the coast, as far as New̄′foundlănd′. By these impediments the current is turned eastward, becomes less deep, but much broader, spreads over the surface, and proceeds with less velocity.

577. The Gulf Stream as it issues from the Florida Pass is of a dark indigo blue; the line of separation between it and the roily green waters of the Atlantic is plainly seen for hundreds of miles. Though this line is finally lost to the eye as the stream goes north, it is detected by the thermometer for several thousand miles. The surface of the stream is roof-shaped; that is, it is higher in the middle and lower at the edges. Its bed from the "Narrows" northward is ascending, and therefore the current of waters is actually forced up an inclined plane, and what it loses in depth is gained in breadth on the surface.

578. The prevalence of the S. W. winds in the North Atlantic causes the effects of these warm waters of the tropics to be felt beyond the prescribed limits of the current. The coasts of the British Isles and Norway are bathed in moisture, their temperature is softened, and often plants and seeds from the tropical regions are deposited along their shores.

579. Among the agents concerned in producing the Gulf Stream, there are two which are prominent. One of these is the increased saltness of its waters after the trade winds have been supplied with vapor from it; and the other is in the diminished amount of salt which the Bâl′tic and North Seas contain. The waters of the Caribbē′an Sea and Gulf of Mexico are much more salt and heavy than common sea water, while that of the Bâl′tic and North Seas are but little more than brackish, and are lighter than sea water. "In order to comprehend aright the currents of the sea, it is necessary to understand the effects produced by the *salts* of the sea upon the equilibrium of its waters; for wherever equilibrium be destroyed, it is restored by motion, and motion among fluid particles gives rise to currents, which in turn constitute circulation." — [Maury.]

Temperature. Course. Impediments to its progress. — 577. Color. Thermometer test. Shape of surface of the stream. Bed. — 578. Effects of the warmth of the Gulf Stream. Where felt. — 579. Two prominent agents concerned in causing this stream. Remark of Lieutenant Maury on the *salts of the sea.* —

§ 5. NORTH POLAR CURRENTS.

580. There is a powerful current setting from Baffin's Bay through Davis's Straits, which moves an immense volume of water down towards the equator. Laden with icebergs, this current meets the Gulf Stream near the Grand Banks, where it is divided. One branch continues as an under current towards the Caribbē′an Sea, and the other, pursuing its course to the south, is felt as an in-shore current along the coast of the United States as far as Florida.

581. Besides this constant surface current which is setting out of the Arctic Ocean, there is an under current setting from the Atlantic towards the polar basin. This under current is known to exist, from the fact that immense icebergs, with tops reaching high up in the air, and of course their bases extending far down into the depths of the ocean, are often seen ripping and tearing their way, with terrific force and violence, through the surface ice, or against a surface current, and moving onward towards the north with great velocity.

582. There is on the usual sailing route between New York and the north of Europe, which runs with the Gulf Stream, a body of cold water, which presses down into the Gulf Stream from the north, causing a bend like a horseshoe. This "bend" is the great receptacle of the icebergs which drift down from the north. It varies in position and extent, often covering several thousand miles of surface; and it affords instances of the greatest and most sudden changes that are known to take place in the temperature of the surface waters of the sea. Between this horseshoe bend of cold water and Newfoundland there is a layer or branch of warm waters, probably a branch of the Gulf Stream. The difference of temperature between these two bodies of water produces those dense fogs that hang over the Banks of Newfoundland.

583. COUNTER CURRENTS are of such frequent occurrence that there is scarcely a strait joining two seas which does not furnish an example — a current running in along one shore, and another running out by the other. One of the most remarkable of these is found in the Atlantic. It begins off the coast of France, and after sending a mass of water into the Mediterranean, it holds a southerly course at some distance

---

580. Surface current from Baffin's Bay. Icebergs. Under current. In-shore current. — 581. Under current setting *towards* the polar basin. How known to exist. — 582. Occurrence on the sailing route between New York and the north of Europe. The "horseshoe bend." Cause of the dense fogs on the Banks of Newfoundland. — 583. Counter currents. Remarkable instance. — 584. The

from Africa. Passing the coast of Libē′ria, it flows rapidly for 1000 miles eastward to the Bight of Biăf′ra, in immediate contact with the equatorial current, which is running with considerable velocity in an opposite direction.

584. Midway in the Atlantic, in the triangular space between the Azōres′, Canā′ries, and Cape Vërd Islands, is the Sargăs′so Sea, so thickly matted over with gulf weed (*fū′cus nā′tans*) that the speed of vessels is often much retarded in passing through it. It is the centre of the whirl caused by the motion of the Gulf Stream in its circuit.

585. WHIRLPOOLS are caused by opposing winds and tidal currents. The Mäel′strom, on the coast of Norway, is occasioned by the meeting of these currents round the islands of Loffō′den and Mŏs′koe. It is a mile and a half in diameter, and so violent that its roar is heard at a distance of several leagues.

§ 6. EFFECTS OF CURRENTS ON NAVIGATION.

586. The safety and length of a voyage depend very much upon the skill with which a seaman avails himself of the course of ocean currents, and of the permanent and periodical winds. From Acapulco, in Mexico, across the Pacific to Manĭl′la or Cantŏn′, the trade wind and equatorial current are so favorable, that the voyage is accomplished in 50 or 60 days; but in returning it requires much longer time.

587. In the Caribbē′an Sea the navigation is so difficult from winds and currents, that a vessel, in going from Jamāi′ca to the Leew̆′ard Islands, must go round through the Windward Passage between Cuba and Hāy′ti to the ocean.

588. The outward passage from the United States to Europe is one third shorter than the return voyage. Ships from Europe to the West Indies, Central or South America, generally take their departure from the Canā′ries, in order to fall in with the N. E. trade winds.

589. The passage from the English Channel to the Cape of Good Hope may be undertaken at any season; but it is necessary to regulate the voyage from the cape to India and China according to the seasons of the monsoons.

590. Before the Gulf Stream was known to practical navi-

Sargasso Sea. — 585. Whirlpools. Maelstrom. — 586. Of voyages as influenced by winds and currents. — 587. Navigation in the Caribbean Sea. — 588. Passages to Europe from the United States. Voyages from Europe to the West Indies, &c. — 589. Passage from the English Channel to the Cape of Good Hope. From the cape to China. — 590. Of commerce before the Gulf Stream was known.

gators the course of trade between England and America was such as to make Charleston, S. C., the half-way house between the mother country and the New England States, including Pennsylvania and New York among the latter. At that time the usual route of vessels bound to America was to run down on the other side of the Atlantic towards the Cape Verds, till they got the N. E. trade winds, and with them steer for America. This was the route taken by Columbus. It brought them upon the coast of the Southern States; then steering to the northward, they drifted along until they reached their place of destination. Charleston then had more commerce than New York and all the New England States put together.

591. About the year 1785 Dr. Benjamin Franklin announced that simply by dipping a thermometer in the water navigators might know when they entered and when they cleared the Gulf Stream. This changed the route across the Atlantic, shortened the passage from 60 to 30 days, coming this way, and consequently changed the course of trade also; the northern ports became the half-way house, and Charleston an outside station.

592. The China Current. — Though the course of the China or "Gulf Stream" of the North Pacific has never been traced out, there are several points of resemblance between it and the Gulf Stream of the Atlantic. Sumä′tra and Malăc′ca correspond to Florida and Cuba; Bornē′o to the Bahā′mas, with the Old Providence Channel to the south and the Florida Pass to the west. The coasts of China answer to those of the United States, the Philĭp′pines to the Bermū′das, the Japăn′ Islands to New′foundlănd′. As with the Gulf Stream, so here with the China Current, there is a counter current of cold water between it and the shore.

593. The climates of the Asiatic coast correspond with those of America along the Atlantic; and those of Or′egon, Washington, and Vancôu′ver are duplicates of Western Europe and the British Isles. The climate of the State of California resembles that of Spain; the sandy plains and rainless regions of Lower California remind us of Africa, with its deserts between the same parallels. The North Pacific, like the North Atlantic, is enveloped, where these

---

Usual route of vessels bound to America. Charleston, S. C. — 591. Discovery by Dr. Franklin. Effect on Charleston. — 592. The China or "Gulf Stream" of the North Pacific. Points of resemblance to the Gulf Stream of the Atlantic. — 593. Correspondence of climate. Of mists and fogs. The fisheries. Physical law respecting fishes as food.

warm waters go, with mists and fogs, and streaked with lightning. The Aleŭ′tian Islands are as renowned for fogs and mists as are the Grand Banks of New̄′foundlănd′. The fisheries of Japăn′ are quite as extensive as those of New̄′foundlănd′, and the people of each country are indebted for their valuable supplies of excellent fish to the cold waters which the currents of the sea bring down to their shores. It seems to be a physical law that cold water fish are more suitable for food than those of warm water.

Problems for Solution.

594. *a.* What effect would it have on the Gulf Stream if Mexico, Central America, and the West Indies were entirely removed?

b. What becomes of the water that is carried off from the Red Sea by the winds?

c. What benefits result to Europe from the position of the Desert of Sahä′ra?

d. Remove the Rocky Mountains, and what effect would it have upon the Valley of the Mississippi?

e. If the Parî′ma and Brazĭl′ian Mountains were united along the coast, so as to block up the mouth of the Amazōn′, where would that river find its chief outlet? What other effect would it have upon the river?

f. If the continent of North America were 20° farther north, what changes would be perceptible?

g. Suppose the contôurs′ and reliefs of South America to be wholly reversed from east to west, would it remain the same as it now is in all other respects? Explain it.

h. Would Europe be the same as now if it were appended to the eastern border of Asia?

i. If the Alleghā′nies were continued without interruption westward from their southern extremity until they united with the Rocky Mountains, what consequences would follow as to climate, &c.?

j. How would it affect Rŭs′sia if the Scandinā′vian Mountains, in their highest elevation, were continued along the northern border to join the U′ral Mountains?

k. The cities of Vê′ra Crŭz and Mexico are in the same latitude, and about 200 miles apart: have they the same climate? Give the reasons for your answer.

l. If Europe, with all its islands and peninsulas, were united into one compact mass, what changes would result?

m. Suppose the position of North America to be inverted, by turning on the Lake of the Woods as a centre, so as to place Mexico in the polar regions, and British America in the tropical, what would be the condition of the United States?

n. What change of aspect would ensue if South America were tilted on the 60th meridian as an axis, so as to elevate Cape St. Rōque 1000 feet, and depress Cape Blän′co in the same degree?

o. Suppose Quî′to, with its present elevation, to be placed in North America, on the parallel of 60°, what would be the consequence?

p. What change of circumstances in Africa would render the Sahä′ra a fertile plain?

q. What change in the reliefs of Asia would supply the rainless districts with moisture?

r. Whence comes the vapor which forms the rains that fall on the immense watershed to which the American lakes give drainage?

s. In countries where the soil is moist and warm, and the air is damp and cold, which will be the most prevalent, dew, fogs, or clouds? What countries afford an example?

t. Hăm′merfest, in Norway, is the most northern town in Europe. Though north of 70°, the heat in summer is sometimes oppressive, and in winter the climate is mild enough to carry on the fishery. How will you account for this?

u. Suppose a certain mountain range, thousands of miles to the S. W. of the great American lakes, but across the path of the S. W. winds, were to be suddenly elevated, and its crest pushed up into the regions of snow, having a mean temperature of 30° Fahrenheit; what would be the consequences?

v. Cŏr′allines are at work about the Gulf Stream; they have built up the Florida Reefs on one side, and the Bahā′ma Banks on the other. Suppose they should build up a dam across that pass, and obstruct the Gulf Stream; and that, in like manner, they were to connect Cuba with Yucatăn′, by damming up the Yucatăn′ Pass, so that the waters of the Atlantic should cease to flow into the Gulf; what should we have?

w. If the crest of the Siĕr′ra Nevä′da Mountains, in California, were from 1500 to 2000 feet lower, what effect would it have upon the Great Basin of the Salt Lake?

x. There are indications that the Dead Sea, and the great inland basins of Asia, once had a higher water level than they now have, and that formerly the amount of precipitation was greater than it now is. What is the probable cause of the present state of these basins?

y. A boy who lived in the capital of Ohio made a very pretty little boat. One day, as he was playing with it, it floated beyond his reach, and was carried down the stream which passed his father's house. A long while after, he visited Europe, and as he was walking along the sea shore on one of the Loffoden Islands, he found, to his surprise, the boat he had so long before lost. Through what rivers, bodies of water, and oceanic currents, had it passed, if carried thither by the action of the water alone?

z. If the Straits of Gibrâl'tar were barred up so that no water could pass through, what effect would it have upon the Mediterranean Sea?

§ 7. EXERCISES FOR EXAMINATION.

595. By what fluids is the solid matter of the earth surrounded?

Describe the earth's atmosphere, and mention its probable height.

What are some of its uses and operations?

What effects are produced in the temperature of the air by height above the sea level?

What is meant by the term *climate*?

What are the prominent causes of diversity of climate?

What are the three principal elements of climate?

What is the grand agent in diffusing heat over the earth's surface?

Mention the effects produced by the earth's diurnal rotation; and also the beneficial results from its inclined position in its orbit.

How far does the artificial division of the earth into torrid, temperate, and frigid zones correspond with the climates of those regions?

What are *isotherms*? Do they run parallel with the equator?

What is the average degree of heat of the line of highest temperature?

What regions does it cross?

What is meant by an *insular* climate? What by an *excessive* climate?

Mention an instance of the effects produced by a large surface of water in tempering the climate of certain regions of the earth.

Give some account of the height of the snow line in different regions.

Why is it higher at certain distances from the equator than under that line?

Describe the effects produced on vegetation by elevation above the sea level, in the hot regions of the earth.

Give some account of the temperature of mountains near table lands.

What effects are produced on climate by the nature of the soil? What by the prevailing winds?

How do mountain ranges affect climate?

What effects are produced on climate by the currents of the ocean?

What districts usually possess the more excessive climates?

Does the temperature vary as much in intertropical as in temperate regions?

Does electricity act any part in the natural world?

What is meant by positive electricity? By negative?

In what electrical state is the crust of the earth considered to be?

In what state is pure atmosphere?

What is meant by conductors and non-conductors? Give examples.

Mention some of the effects of the action of this powerful agent.

What is terrestrial magnetism?

By what means is the distribution of terrestrial magnetism ascertained?

In what direction does the magnetic needle point?

Is this direction invariable?

What is meant by the dip of the needle?

What is the magnetic equator?

By what influence is terrestrial magnetism affected?

Give the exact situation of the north magnetic pole. Of the south magnetic pole.

What appears to give rise to winds, or the circulation of the atmosphere?

Describe a sea breeze. A land breeze.

What are the trade winds?

What causes S. W. and N. W. winds to prevail in higher latitudes?

Give a description of the monsoons.

How are the calm zones respectively situated?

What is meant by the "horse latitudes"?

State the proof of the existence of an upper current of air passing from the southern hemisphere, and falling to the surface in the northern hemisphere.

Describe the movement of the belt of equatorial calms.

Give an account of the cloud ring.

Where are the typhoons prevalent, and why?

What winds are regarded as the great evaporating winds?

In what state is water always present in th[illegible]tmosphere, and by what means does it find its way there?

When is the atmosphere said to be saturated?

On what does the capacity of the air for moisture depend?

What follows the meeting of two currents of air of different temperature?

Why are mountain chains styled the great condensers?

Of what advantage is a system of highlands to the adjacent lowlands? Is this invariably the case?

What examples can you adduce in support of this assertion?

How do we know when the precipitation exceeds the evaporation from any given tract of country?

How are clouds formed? Of what do they consist?

Mention also how rain is formed, and under what circumstances hail and snow are formed.

What names are given to the principal forms of clouds? Of the combinations or secondary forms?

At what height in the atmosphere is the region of clouds?

Which are the highest, and which the lowest clouds?

Mention some of the offices which clouds perform.

How is dew formed? What is frost?

In which hemisphere is the chief evaporating surface?

While evaporation is going on in one hemisphere, what is taking place in the other?

How is the earth divided with regard to the distribution of rains?

In what parts of the earth does the greatest quantity of rain fall?

Is it more or less abundant in the new world than in the old? State the comparative quantities.

Mention the rainless districts of the earth.

State the cause of the difference in the amount of rain in different regions.

Give some particulars about rainy and dry seasons.

What regions are characterized by continuous rains?

What relation subsists between the inland seas of Europe and Asia and the plains of Siberia?

What relation subsists between the Valley of the Mississippi and the South Pacific Ocean?

Where were the vapors formed which feed the sources of the Amazon?

What contrast is presented between the eastern and western slopes of the Andes, with regard to rain? Why is this?

State the effects resulting from the position of the Lupata chain of mountains in Africa.

What characterizes the climate of Western Europe, and what circumstances conspire to produce it?

What is the supposed condition of the interior of Australia? Why?

State the peculiarity which marks each of the several continents.

What causes the perpetual movement of the waters of the ocean?

How are waves produced? Mention some particulars concerning waves.

By what attraction are tides caused?

Explain the phenomena of spring tides. Also of neap tides.

Mention some other beneficial effects of the moon upon the earth.

Show how the difference in saltness may produce motion in the waters of the sea.

Name the most remarkable marine currents.

Describe the great equatorial current. The south polar current. Humboldt's current.

Give an account of the currents of the Indian Ocean.

Describe the Gulf Stream of the Atlantic.

What influences coöperate to render the temperature of the N. W.

coasts of North America and Europe higher than that of the eastern coasts of Asia and North America?

How is the existence of an *under current* setting from the Atlantic towards the polar basin proved?

How do you account for the dense fogs that hang over the Banks of Newfoundland?

Give some account of the Sargasso Sea.

Mention some points of resemblance between the warm current of the North Pacific and the Gulf Stream of the Atlantic.

CHAPTER XX.

THE GEOGRAPHICAL DISTRIBUTION OF VEGETABLES.

"He causeth the grass to grow for the cattle, and herb for the service of man, that he may bring forth food out of the earth." — *Ps.* civ. 14.

596. The greater part of the land surface is clothed with vegetation, the different species of which are not scattered promiscuously, but were originally placed in those regions to which they were adapted. The mountains, the valleys, the plains, the ocean beds, each have their peculiar kinds; some requiring the hottest climate, some a more temperate air, and others thriving only in the midst of ice and snow. Situations never penetrated by the solar rays, as the dark vaults of caverns and the walls of mines, have their peculiar vegetation. There is only one state which seems fatal to the existence of vegetable life — it is, *the entire absence of moisture.*

597. The most important species of plants are those which furnish food for man and the domestic animals — the grains, fruits, roots, and grasses. But all plants have their uses, for nothing is created by Divine Wisdom without a purpose.

598. There are vast districts of the earth which have not yet been explored by the botanist, as the interior of Africa and Australia, with sections of America, Asia, and Oceanica, so that it is impossible to state the whole number of species in the vegetable kingdom. At the present time, however, the catalogue embraces 89,000 species.

599. The vegetable kingdom is divided into three great classes, which differ materially in their structure. Cryptŏg′amous plants — those which have no flowers, properly so called. They are the mosses, lī′c̱hens, fŭn′ġi, fĕrns, and algæ. Endŏġ′enous plants — those which have stems in-

---

596. Of the land with regard to vegetation. Diversities of place and temperature sustaining vegetation. The only condition fatal to vegetable life. — 597. Most important species of plants. Nothing in nature without a purpose. — 598. Unexplored districts. Present number of known species of plants. — 599. Three principal classes of plants — cryptogamous plants, endogenous,

creasing from within. They are the numerous grasses, lilies, and the pälm family. Exŏg′enous plants — those which have stems growing by additions from without. This is the most perfect, beautiful, and numerous class, embracing the forest trees, most flowering shrubs, and herbs.

600. The first class affords the most numerous examples of wide diffusion. Some species of the second class are also widely distributed. But only in very few instances are the same species of ĕx′ogens met with in regions far apart from each other. In passing from one country to another, we generally find a new *flō′ra*. All the plants of all kinds belonging to a country constitute the flō′ra of that country. A plant is considered as belonging to those regions only in which it will flourish and bear fruit with the natural temperature of the seasons.

601. In equatorial and tropical countries, where a sufficient supply of moisture combines with the influence of light and heat, we find vegetation in all its magnitude and glory. The lower orders, mosses, fŭn′ġi, and confĕr′væ, are very rare. The fĕrns grow as trees. Reeds ascend to the height of a hundred feet, and rigid grasses rise to forty feet. The forests are composed of majestic leafy evergreen trees, bearing brilliant blossoms, their colors finely contrasting, scarcely any two standing together being of the same species. Enormous creepers climb their trunks, parasĭt′ical plants hang in festoons from branch to branch, and increase the floral decoration with scarlet, purple, blue, rose, and golden hues.

602. Of plants used by man for food, or as luxuries, or for medicinal purposes, occurring in this region, rice, banä′nas, dates, cō′coa, cacä′o, breadfruit, coffee, tea, sugar, vanĭl′la, cinchō′na, pepper, cinnamon, cloves, and nutmegs, are either characteristic of it as being principally cultivated within its limits, or entirely confined to them.

603. Rice, the chief food of perhaps a third of the human race, is cultivated beyond the tropics, but principally within them, and only where there is a plentiful supply of water. It has never been found wild; its native country is unknown, but probably is Southern Asia.

604. Bananas, or plantains, are cultivated in intertropical Asia, Africa, and America. The banana is not known in an uncultivated state. Its produce is enormous, estimated to be as 133 to 1 of wheat, or as 44 to 1 of the potato.

---

and exogenous. — 600. Their diffusion. Definition of *flora*. — 601. Vegetation in equatorial and tropical countries. Evergreens. Creepers. Parasites. — 602. Tropical plants used for food, luxuries, or medicines. — 603. Of rice. —

605. Dates and Cocoa belong to the family of palms, which are remarkable for their elegant forms and importance to man. They impress upon the vegetation of tropical countries its peculiar cast or expression. The date palm is a native of Northern Africa, and is so abundant between the Barbary States and the Sahä′ra, that the district has been named the Land of Dates. It skirts the margin of the desert in all its bendings, from the shores of the Atlantic to the confines of Persia, and is the only vegetable affording subsistence to man that can grow in such an arid situation. The annual produce of a single tree is from 150 to 260 pounds weight of fruit. The cō′coa palm furnishes annually about a hundred cocoa nuts. It is spread throughout the torrid zone, but is most abundant in the East India Islands.

606. Cacao, from the seeds of which chocolate is prepared, grows wild in Central America, and is extensively cultivated in Mexico, Guatemä′la, and on the coast of Cumanä′.

607. Breadfruit tree, a native of the South Sea Islands and East Indies, grows also in Southern Asia, and has been introduced into the tropical parts of America. The fruit is not equal to the banä′na as an article of food.

608. Coffee. — The bush is probably a native of the Ethiopian highlands, from whence it was taken in the fifteenth century to the highlands of Yê′men, the southern part of Arabia, of which Mō′cha is the chief seaport. It has been introduced and is now extensively cultivated in British India, Ceylōn′, Jä′va, Mauri′tius, Brazîl′, and the West Indies, but the quality is inferior to that of Mō′cha. Coffee was first introduced into Vĕn′ice in 1615, into England in 1652, and into France in 1658.

609. Tea. — The plant is indĭg′enous in China, Japăn′, and Upper Assăm′. In the latter country it has recently been found in a wild state, and is in process of extensive cultivation there. Tea was first introduced into Europe by the Dutch in 1666.

610. Sugar Cane occurs to some extent without the tropics, having been cultivated centuries ago in Europe; but it properly belongs to the torrid zone, and has for its principal districts the Southern United States, the West Indies, Venezuē′la, Brazîl′, Maurĭ′tius, British India, China, the Sŭn′da and Philĭp′pine Islands. The plant was found wild in several

---

604. Bananas. — 605. Dates and cocoa. Date palm. Cocoa palm. — 606. Cacao. — 607. Breadfruit tree. — 608. Coffee. — 609. Tea. — 610. Sugar cane.

parts of America on the discovery of the continent, and occurs wild on many of the islands in the Pacific.

611. VANILLA, the fruit of which forms the well-known aromatic of that name, grows wild, principally in Mexico, in hot, damp, shady places.

612. CINCHONA, the Peruvian bark, a forest tree, of which there are several species, furnishes the valuable medicine of that name. It is exclusively confined to South America, and grows chiefly on the Andes of Lŏ′ja and Venezuē′la.

613. PEPPER belongs exclusively to the Malabär′ coast, where it has been found wild. It is cultivated in Sumä′tra, which produces the greatest quantity, Bornē′o, Malay peninsula, and Siăm′. Other species occur in tropical America.

614. CINNAMON, a small tree yielding the aromatic bark, is found native only in the Island of Ceylōn′, but another species occurs in In′do-Chī′na.

615. CLOVE, an evergreen tree of small size, the dried flower buds of which form the celebrated aromatic, grows naturally in the Molŭc′cas, from whence it has been taken to other tropical districts. The Island of Ambŏȳ′na is the principal seat of its cultivation, where the temperature is never below 72°; the mean annual temperature being 82°.

616. NUTMEG grows naturally in several islands of the East Indies, but is chiefly cultivated in the Bän′da Isles.

617. *In passing from the hot to temperate climates vegetation assumes a marked change in its aspect.* Green meadows, abounding with tender herbs, take the place of the tall, rigid grasses which form the impenetrable jungle; and instead of forests composed of lofty evergreen trees, we find woods which cast their leaves in winter, and become torpid in the colder season. They are the oak, ash, elm, maple, beech, lime, âlder, birch, and sȳc′amore. The cultivation of the vine becomes characteristic with the perfection of the cē′real grasses and a larger proportion of herbā′ceous annuals and cryptogăm′ic plants.

618. Farther from the equator magnificent forests of the fir and pine tribes prevail, as in the central parts of Rŭs′sia, on the southern shores of the Bâl′tic, in Scandinavia, and in North America. But some of the cē′reals are no longer cultivated. Several of the timber trees common to the tem-

---

611. Vanilla. — 612. Cinchona. — 613. Pepper. — 614. Cinnamon. — 615. Clove. — 616. Nutmeg. — 617. Aspect of vegetation in passing from hot to temperate climates. Particular kinds of trees. The vine. Cereals. Herbaceous and cryptogamic plants. — 618. The fir and pine tribes. Of some cereals. Timber trees. Woods in the higher latitudes. Northern limits of wood. Southern

perate zone do not reach its northern limits. All woody vegetation gradually disappears as the higher latitudes are attained. The *northern limit of wood* begins in North America, at Norton's Sound, and rises to 68°; then descending, it crosses Great Bear Lake and Hudson Bay, leaving Labrador′ at about 56°; thence bending N. E., it crosses the south of Greenland and north of Iceland, and reaches Europe at North Cape, where it descends S. E. to about 66°, and continues eastward till, in Kamtchăt′ka Sea, it makes a curve south to join the point of commencement. The *southern limit* nowhere reaches the Antarctic continent, though it passes very near it due south of Tierra del Fue′go.

619. There is a remarkable similarity of species, both of plants and animals, in the high latitudes of both continents. In the most northern parts of the arctic lands the year is divided into one long, intensely cold night, and one bright, fervid day, which quickly brings to maturity the scanty vegetation. Within the limit of perpetual snow a very minute red or orange-colored plant finds nourishment in the snow itself. This is the beginning of vegetable life. Large patches of snow in the Alps and Pўr′enees are colored by it.

620. *Lichens* are the first vegetables that appear at the limits of the snow line, whether in high latitudes or mountain tops; and they are the first to appear on volcanic lavas and newly-formed islands, where they prepare the soil for plants of a higher order. They grow on rocks, stones, and trees; in fact, on any thing that affords them moisture. *Mosses* follow lī′çhens on newly-formed soil, and they are found every where throughout the world in damp situations, but in greatest abundance in temperate climates.

621. In some places in Siberia trees grow and grain ripens, even at 70° N. lat.; but boundless swamps, varied by lakes, cover wide portions of this desolate country, which lies buried beneath the snow for 9 or 10 months in the year. As soon as the snow is melted by the returning sun, coarse grass and rushes cover the morasses, while mosses and lī′çhens, mixed with dwarf willows, clothe the plains. The vegetation of the arctic regions is chiefly characterized by the predominance of perennial and cryptŏg′amous plants.

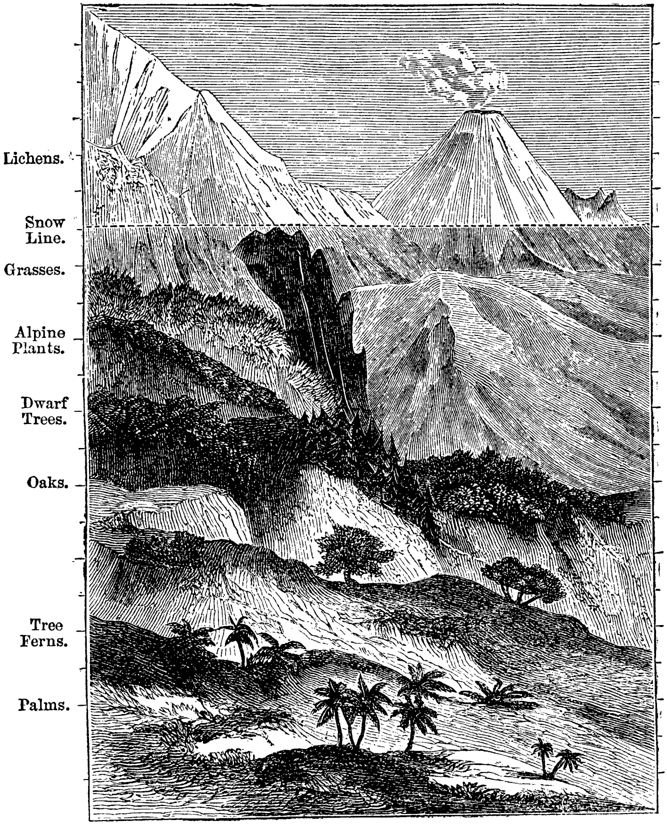
622. A succession of plants appears on the mountains in the torrid zone which rise above the snow line, corresponding

---

limits. — 619. Of plants and animals in high latitudes. Of day and night in the arctic lands. First appearance of vegetable life. — 620. Lichens. Mosses. — 621. Productions of Siberia. Of vegetation in the arctic regions. — 622. Vegetation on mountains. — 623. Plants subjected to a change of climate and

SCALE OF VEGETATION

In Equatorial America, according to the Elevation above the Sea.


Lichens.
Snow Line.
Grasses.
Alpine Plants.
Dwarf Trees.
Oaks.
Tree Ferns.
Palms.

Height of Scale, 22,000 feet.

to those which are found in passing from the equatorial to the polar regions.

623. There are many plants that can accommodate themselves to the most diverse climates and localities; but such plants become singularly modified in appearance and structure.

624. Some plants are confined entirely to one side of the globe. The heath extends from a high northern latitude in the Old World to the Cape of Good Hope; but not a single specimen is found native in America. On the contrary, the New World produces the căc′ti family, while none are found naturally in the Old.

625. Mountain chains very commonly divide distinct floras. There is a marked difference in the vegetation on the Chilian side of the Andes from that on the opposite side, though the climate and soil are nearly the same. In North America two completely different classes of vegetation appear on the two sides of the Rocky Mountains.

626. The splendor of the North American flora is displayed in the United States. The American sycamore, chestnut, black walnut, hickory, white cedar, wild cherry, red birch, locust tree, tulip tree, oak, ash, pine trees of many species, grow luxuriantly; with an undergrowth of rhododĕn′drons, azā′leas, andrŏm′edas, gerär′dias, calycăn′thus, hydrăn′geas, and many more of woody texture; and an infinite variety of herbā′ceous and climbing plants.

627. The vegetation is different on the two sides of the Alleghā′nian Mountains. The locust tree, Canadian poplar, hibĭs′cus, and hydrăn′gea are most common on the west side; the American chestnut and kăl′mias are numerous on the Atlantic side, and aquatic plants are more common.

628. The autumnal tints of the New England forests are beautiful and of endless variety. The superior gorgeousness of the foliage is owing not so much to any peculiarity of climate as to the character of some of our native trees. Among those which contribute to the "many-colored woods" of autumn are the maples, by their vivid yellows and scarlets, the hornbeam, by its deep crimson, the scarlet oak, the yellow beech, and the dark leaves of the evergreen pines, with all their intermediate tints. It is not uncommon to see the sugar maple exhibit three distinct colors, *yellow*, *scarlet*,

---

locality. — 624. Plants peculiar to the eastern continent. To the American continent. — 625. Effect of mountain chains on floras. Examples. — 626. North American flora. — 627. Vegetation on opposite sides of the Alleghanies. — 628. The autumnal tints of New England forests. — 629. For what are the and *green*, at one and the same time, either intermingled or in separate masses.

629. In the Southern States trees and shrubs are remarkable for broad, shining leaves and splendid blossoms — the magnō'lias, catăl'pa, and hibĭs'cus. The magnōlia grandiflora and the tulip tree are the most splendid specimens of this race of plants. The arid soil on the Atlantic coast is covered by the long-leaved pitch pine; the swamps are clothed with cypress, swamp hickory, and the aquatic oak. The western forest is less extensive and less varied than the eastern, but the trees are larger.

630. The native fruits of North America are mostly of the nut kind, of which there are many. To these may be added the Florida orange, the Chickasaw plum, the papâw', the banä'na, the red mulberry, and the persĭm'mon, with various wild grapes.

631. Tobacco, cotton, Indian corn, and rice, though extensively cultivated in the United States, are not natives of this country. The pineapple is entirely American, growing in the woods and savannas of Mexico and Central America.

632. Plants capable of extended naturalization, and serviceable as articles of food or luxury, have been widely disseminated by man in his migrations. The cereā'lia afford a striking example. Wheat, barley, oats, and rye were the gifts of the Old World to the New. It is probable that they were originally from the neighborhood of the great rivers of Western Asia, the primitive location of the human race. Māize, or Indian corn, has been carried to the Old World from the New; as also the potato, the use of which now extends from the extremity of Africa to Lapland.

633. The ocean as well as the land has different botanical regions; and changes of vegetation are observed with the depth similar to the variation of land plants with the height.

---

trees and shrubs of the Southern States noted? Most splendid specimens. The arid soil of the Atlantic coast. Western forest. — 630. Native fruits of North America. — 631. Tobacco, cotton, Indian corn, and rice. Pineapple. — 632. Widely disseminated plants. Probable origin of the cereals. Maize and the potato. — 633. Of marine vegetation.

CHAPTER XXI.

THE GEOGRAPHICAL DISTRIBUTION OF ANIMALS.

> "And God said, Let the earth bring forth the living creature after his kind, cattle, and creeping thing, and beast of the earth, after his kind: and it was so." — *Gen.* i. 24.

§ 1. General Observations.

634. Man is able to adapt himself to all climates, and to subsist on all kinds of food. The domestic animals may live in almost all latitudes where man himself can make his home. But all those animals whose subsistence is independent of man's social habits dwell within certain limits, beyond which they are not inclined to stray. Like plants, they are adapted to the situations in which Creative Wisdom has placed them; and thus we find animals belonging to cold climates provided with warm, furry coats, which would be unsuited to hot regions. Sometimes, when animals of the same species inhabit countries possessing different climates, the garb of the one will differ from that of the other, in accordance with the difference of climate. If by accident, or the agency of man, animals are removed to places uncongenial to their natures, they either perish altogether, or some change takes place to fit them for their new abode.

635. A group of animals embracing all the species, both of land and water, which inhabit any particular region of country, constitutes the *fauna* of that country. There is an evident relation between the fauna of any locality and its climate; but with respect to land animals, there is also a dependence of the fauna upon the flora, for herbivorous animals can only exist where there is an adequate supply of vegetable food.

636. As a branch of natural history, the animal kingdom

---

634. Remark on man and the domestic animals. Of other animals. — 635. Definition of *fauna*. Relation between a fauna, its climate, and flora. — 636. Divisions of the animal kingdom. First. Second. Third. Fourth. — 637.

consists of four great divisions, or departments: I. The VERTEBRATES, including all animals that have an internal skeleton, with a back bone for its axis. It is subdivided into four classes: 1. Mammals, (animals which nurse their young;) 2. Birds; 3. Reptiles; and 4. Fishes. II. The ARTICULATES, animals whose body is composed of rings or joints. It is divided into three classes: 1. Insects; 2. Crustaceans; 3. Worms. III. The MOLLUSKS, animals whose bodies are without a bony skeleton: some have shells, forming a covering and defence; others are destitute of such covering. IV. The RADIATES, animals which, in the greater number, have their organs of motion and sense radiating from a common centre. These last occupy the lowest rank in the scale.

637. The FAUNAS of the globe may be divided into four principal divisions: the Arctic, the Cold Temperate, the Warm Temperate, and the Tropical. Animals dwelling at high elevations upon mountains, where the temperature is much reduced, resemble the animals of colder latitudes rather than those of the surrounding plains.

638. The influence of climate in the polar regions merely induces a greater uniformity in the species of animals. Thus the same animals are found in the arctic regions of the three northern continents. In the temperate regions the species differ on each of the continents, though they still preserve the same general features. In the tropical regions the animals are not only different from those of the temperate zone, but they also present the greatest variety among themselves.

639. The natural features of the earth's surface limit the fâu′nas more or less distinctly. A mountain chain, a desert, or the sea effects a separation between two fâu′nas. Where there is no natural limit the transition from one fâu′na to another is hardly preceptible. The range of species does not depend upon their powers of locomotion, for those which are active have a narrower range than those which move slowly and with difficulty.

640. A very important influence is exerted upon the grouping of animals, and upon the extent of their distribution, by the nature of their food. Carnĭv′orous animals have a wider range than herbĭv′orous ones, because their food is to be found almost every where. The peculiar figure of a country

---

Divisions of the faunas of the earth. Resemblance between animals of high elevations and those of the colder latitudes. — 638. Influence of climate in the polar regions. Temperate regions. Tropical regions. — 639. Natural limits of the fauna. Absence of a natural limit. Range of species. — 640. Influence sometimes determines a peculiar grouping of animals into local faunas.

641. The range of marine animals is confined to the vicinity of the shores, and their distribution must therefore depend upon laws similar to those which regulate the land faunas. Migrating animals are considered as belonging to the place where they make their habitual abode.

§ 2. ARCTIC FAUNA.

642. The prominent feature of the arctic fauna is uniformity, which appears in the regularity of form and the dusky tints of coloring. There is not a single bird of brilliant plumage, nor a fish with varied hues belonging to this fauna. The species are few in number, but they comprise multitudes of individuals. Clouds of birds hover upon the islands and shores of the north, and shoals of fishes throng the coasts.

643. The most conspicuous animals are the white bear, moose, reindeer, musk ox, white fox, polar hare, lemming, and various seals; the whales are the most important. Among the birds there are some eagles and a few wāders, with immense numbers of gulls, cŏr′morants, divers, pĕt′rels, ducks, geese, &c. There are no reptiles, and insects are rare.

644. The southern boundary of the arctic fauna corresponds nearly to the line where forest vegetation succeeds the vast barren plains. In North America it is farther north on the western side than on the eastern; and still farther north in Europe, where it touches the continent at North Cape, and then descends to the latitude of 65°, following that till it crosses the southern part of Kamtchăt′ka.

§ 3. TEMPERATE FAUNAS.

645. The north temperate zone may be subdivided into two regions — a northern or cold region, where the trees, except the pines, drop their leaves in winter; and a southern or warm region, where the trees are evergreen. The dividing line would coincide with a line running about four degrees nearer the equator than the limit of the vine. In the United

---

of food on the grouping of animals. Local faunas. — 641. Range of marine animals. Migrating animals. — 642. Prominent feature of the *arctic fauna.* Species and individuals. — 643. Most conspicuous kinds of animals. Birds. Reptiles. Insects. — 644. Southern boundary of the arctic fauna. — 645. Sub

States it would run between the Carolinas, and in Europe it would extend along the Pȳr′enees and the Alps.

646. The temperate faunas are more varied than those of the arctic regions. There are many animals of graceful form, animated appearance, and varied colors. The forests swarm with insects, worms, &c., which become the food of still other animals. The principal among the mammalia are the bison, deer, ox, horse, hog; numerous rodĕn′tia, especially squirrels and hares; nearly all the insectĭv′ora, with the weasel, marten, wolf, fox, and wildcat. Among the birds there is a multitude of climbers, păs′serine, gallinā′ceoŭs, and many rapacious birds. Of reptiles there are lizards, tör′toises, and serpents. Of fishes, the trout, sturgeon, pike, cod, herring, and mackerel are numerous.

647. The faunas of the SOUTH TEMPERATE REGIONS differ widely from those of the north. Here, also, there are two divisions, the colder of which embraces Patagonia, where we find peculiar species of seals, and, among the aquatic birds, the penguin.

648. Each of the three southern continents presents in its fauna a separate world. The animals of South America, beyond the tropic of Capricorn, are in all respects different from those of Southern Africa. The hyē′na, wild boar, and rhinŏç′eros of the Cape of Good Hope have nothing like them in South America, and the difference is equally great between the birds, reptiles, fishes, and insects.

649. Australia has a fauna wholly unlike that of the rest of the world. Its animals are entirely unusual in type, few in species, and still fewer individually. Among the most remarkable may be mentioned the kangarôô′, kangarôô′ rat, the flying opŏs′sum, and the duck-billed mole.

§ 4. TROPICAL FAUNAS.

650. In the intertropical regions we find that quadrupeds are most remarkable for their magnitude, strength, and ferocity; that reptiles are larger and more venomous; that birds are decked with the most splendid plumage, and the insect tribes distinguished for their size and the brilliancy of their tints.

---

division of the *temperate faunas.* The dividing line. — 646. Animals of these faunas. Mammalia. Rodentia. Insectivora. Birds. Reptiles. Fishes. — 647. Faunas of the south temperate regions. Divisions. — 648. Faunas of the three southern continents. Comparison between South America and South Africa. — 649. Of Australia. — 650. *Tropical faunas.* By what distinguished?

651. The most perfect and the most singular types of all classes of the animal kingdom are found here. This is the region of the monkey tribe, the herbĭv′orous bats, the giräffe′, the elephant, the hippopŏt′amus, and the tāpir, with the whole family of toothless animals. Here also are the largest of the cat kind — the lion and the tiger. Among the birds are the parrots, toucăns, and humming birds; of reptiles, we find the largest crŏc′odiles, and gigantic tŏr′toises; and of insects an immense variety of the most beautiful kinds. The marine animals, taken as a whole, are superior to those of other regions; and groups of islands in the torrid zone are covered with cŏr′al reefs formed by the cŏr′al insects.

— 651. Peculiarity of types. Birds. Reptiles. Insects. Marine animals. Coral insects.

CHAPTER XXII.

THE GEOGRAPHICAL DISTRIBUTION OF MANKIND.

"For thou hast made him a little lower than the angels, and hast crowned him with glory and honor. Thou madest him to have dominion over the works of thy hands. Thou hast put all things under his feet." — *Ps.* viii. 5, 6.

652. MAN is justly separated from all other members of the animal kingdom, and regarded as forming an order by himself, comprising a single species, exhibiting many varieties. The most inferior specimen of the human race is distinguished from any mere animal by a difference immensely great.

653. He can subsist under the greatest extremes of climate, owing chiefly to the pliancy of his constitution, although obtaining much artificial aid. The Es'quimaux endure the cold between the parallels of 70° and 80°. The African subsists under the burning sun of the equatorial regions. And the European, accustomed to an intermediate temperature, has borne the rigor of the highest accessible latitude, and the fiercest heat of the torrid zone.

654. He can adapt himself to very different states of the atmosphere as to density, though with a varying capacity in different individuals. He is not confined to any particular kind of food, but subsists, in different situations, with equal facility on a very varied diet. Vegetables are the chief food of the nations within the tropics; animal food supplies the polar tribes; and both contribute to support the inhabitants of temperate climates. He is thus fitted for a very wide geographical range, and may occupy regions that are physically discordant.

655. In high latitudes, where snow covers the ground through most of the year, and vegetation is scanty, entire tribes live on fish and seals. Towards the equator, where vegetation is most profuse, vast numbers thrive with no other

---

652. Man distinct from the rest of the animal kingdom. — 653. Man in relation to climate. — 654. To the atmosphere. To food. — 655. Food in high lat-

articles of support than cocoa nuts, bananas, yams, and rice. In the intermediate districts, the special region of the various kinds of grain, and where animal food can as readily be procured, the people subsist on a mixed diet.

656. The principal physical differences observable among mankind refer to varieties of strength, stature, proportion of limbs, texture of skin, character of hair, color, and the form of the skull.

657. The distribution of mankind over the surface of the earth, and that of the other organized beings, are not founded on the same law. We have seen that, in both the vegetable and animal kingdoms, all the types go on increasing in strength and development from the polar regions towards the equatorial, where they appear in their greatest perfection. But in the distribution of mankind there is a different law from that which governs the distribution of plants and animals.

658. In the latter the degree of perfection is in proportion to the intensity of heat and other agents stimulating the display of material life. They attain the end of their existence here. The law of their being is purely physical. In man the degree of perfection does not rest upon his physical organization alone, but also upon the degree of his intellectual and moral improvement. Man does not attain the end of his existence here. The law of his being is moral — it is a law of development.

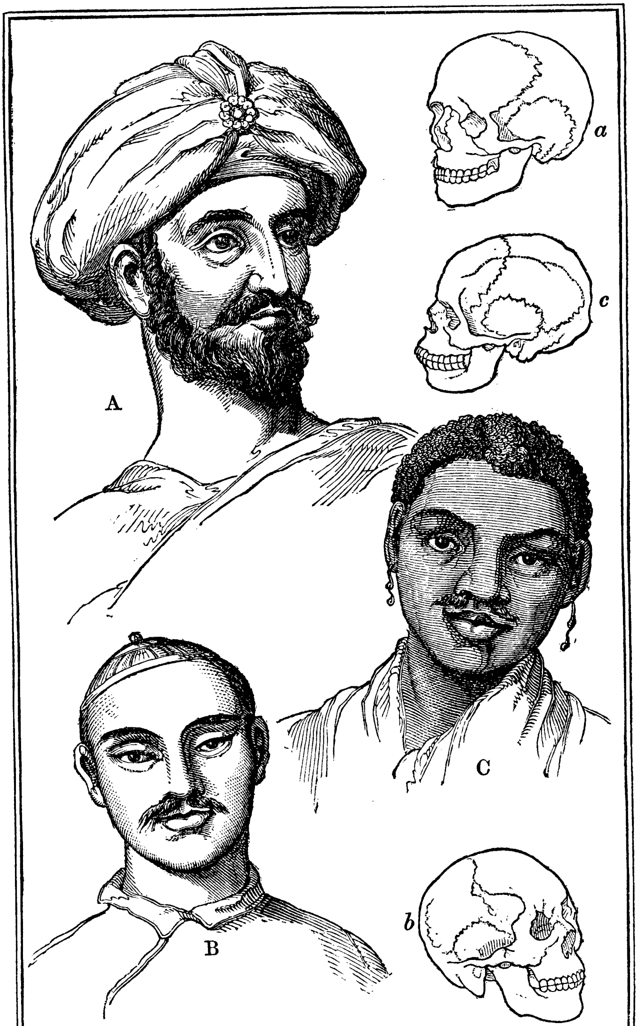
659. We accordingly find the most exalted of the human race inhabiting those parts of the earth's surface which are most favorable to the growth and development of all his powers. These are not in the frozen regions, where his time and strength are exhausted in procuring a scanty sustenance; nor under the enfeebling influences of the tropical regions, where the life of the body overmasters that of the soul; but they are in the temperate climes, where the alternations of heat and cold, the changes of the seasons, a fresher and more bracing air, incite man to the vigorous employment of all his faculties.

660. Blū'menbâch classified the human family into five great varieties, marked by strong distinctive characters — the

---

itudes. Towards the equator. The intermediate district. — 656. Principal physical differences. Refer to what? — 657. Fact observed in the vegetable and animal kingdoms. Law of distribution in the human races. — 658. Perfection in plants and animals proportioned to what? Law of their being. Threefold nature of man. Governing law. — 659. Localities of the most perfect of the human races. The frozen regions. Why unfavorable to man's development? Why not the tropical regions? Temperate regions. Why favorable? — 660.

TYPES OF THE RACES.



A *a* Caucasian. B *b* Mongolian. C *c* Negro.

Caucă'sian, Mongō'lian, Malāy', Ethiō'pian, and American. But these varieties are limited by Cūvier to three leading types, founded on the conformation of the skull — the Caucă'sian, Mongō'lian, and Ethiō'pian.

661. The *geographical centre* of the human family is in the regions of Iran', Armē'nia, and the Câu'casus, where exists the purest and most perfect type. In proportion as we depart from this centre in the three general directions of the lands the types gradually degenerate, and in the extreme points of the southern continents we find the lowest in the scale of humanity.

662. The CAUCASIAN race, the characteristics of which are, the regularity of the features, the grace of the lines, and the perfect harmony of the whole figure. The head is oval, with no part too prominent beyond the others. The hair is fine. The face is divided into three equal parts, by the line of the eyes, and that of the mouth. The eyes are large, well defined, not too near the nose, nor too far from it, and their axis is placed on a line at right angles with the line of the nose. The facial angle * is 90°. The stature is tall, pliant, and well proportioned; the shoulders neither too broad nor too narrow. The length of the extended arms is equal to the whole height of the body. Though commonly called the white race, it is evident that color is not a characteristic, since they are of all shades, from fair and florid to the clear dark brown.

663. The Caucă'sian group of nations includes the handsomest, the most civilized, and the most intellectual portion of mankind. They inhabit all Europe, except Lapland, Finland, and Hungary; they occupy North Africa as far as the 20th parallel of north latitude, Arabia, Asia Minor, Persia, the Himalaȳ'a to the Brahmapôô'tra, all India between these mountains and the ocean, and the United States of North America.

664. The MONGOLIAN race forms the second variety. Their characteristics are broad heads, prominent cheek bones, eyes compressed, wide apart, elevated at the outer

---

* The *facial angle* is formed by a line drawn horizontally from the entrance of the ear to the edge of the nostrils, and another line from this latter point to the ridge of the eyebrows.

Divisions of the human family. — 661. Geographical centre of the races. — 662. Characters of the Caucasian race. Head. Hair. Face. Eyes. Facial angle. Stature. Shoulders. Arms. Color. — 663. This group includes what? Countries occupied by this race. — 664. Characters of the Mongolian race. — 665.

corners, long black hair, and yellow or sallow olive complexion. There is a want of harmonious proportions throughout the entire person.

665. The Mongō′lian group of nations occupies all Asia Minor north of the Persian table land, and north of the Himalay′a, the whole of Eastern Asia from the Brahmapôô′tra to Bēhr′ing's Straits, together with the arctic regions of America north of Labradōr′.

666. This variety includes the Tôôr′komans, Mŏn′gol, and Tartar tribes, the Chinese, Indo-Chinese, Japanese, Es′quimaux, Fins, Laplanders, and Hungarians.

667. The Ethiopian race forms the third variety. The distinguishing features of this group are, the retreating forehead, prominent mouth, thick lips, flat nose, woolly head, and black complexion. They occupy all Africa south of the Sahä′ra, and half of Madagăs′car.

668. The Malay variety, being the fourth of Blû′menbach's classification, seems to have sprung from a mixture of the Mongō′lian with the Caucä′sian. They have a very dark complexion, with lank, coarse black hair, flat faces, eyes set obliquely, projecting jaws, and a gaunt body.

669. The Malāys′ occupy the continent of Australia, the islands of New Guĭn′ea, Van Diē′men's Land, New Zēa′land, Chatham, the Society Islands, the Philĭp′pines, Formō′sa, Mindanä′o, Gilō′lo, the highlands of Bornē′o, Sumbâ′wa, and Timōr′. In this variety are found some of the ugliest and most degraded specimens of the human family.

670. The American or Indian race forms the fifth variety. They are distinguished by a reddish brown or copper color, long black hair, deep-set black eyes, prominent cheek bones, aquiline nose, and often by handsome slender forms. They inhabit the American continent from 62° N. lat., to the Straits of Magĕl′lan. The North American Indian has a marked superiority over the Indian of the south.

671. Another mode of classifying the varieties or races of mankind is by the affinity of languages. It appears that the number of peculiar forms widely differing from each other is very great, and probably is not less than 2000. A comparison of various languages, however, shows that many bear a family resemblance, which is exhibited in the circumstance of a large

---

Countries occupied by this race. — 666. Tribes and nations of this race. — 667. Origin of the Malay race. Characters. — 668. Countries of this race. Malayans compared with other races. — 669. Characters of the African race. Their native abode. — 670. Characters of the American or Indian race. Their native lands. The Indian of North and of South America. — 671. Another mode of classifiproportion of their roots being common to the whole group, united with a general resemblance in grammatical structure. Nations, whose idioms have this affinity are considered as related in origin.

672. One strongly marked family of languages consists of the dialects collectively termed the *Semitic;* (so named from the supposed descent of the nations who speak them from Shem, the son of Noah.) To this family belong the Hebrew, the Aramean, including the Babylonian and the Syriac, and the Arabian, to which the Ethiopic is very closely allied. Another family of languages is the *Indo-European*, which includes various idioms of Europe and Asia. This is a most extensive group, and contains six branches, two of which belong to Asia, and four to Europe. — 1. The Sanscrit, and all its dialects in India. 2. The ancient Zend, and all the idioms now spoken in Persia and Armenia. 3. The Greek and Latin languages, and all the dialects sprung from them. 4. The Slavonic, the origin of the Russian, Polish, and Bohemian languages. 5. The Teutonic, with the Gothic at its head, and comprising the different German dialects, the Anglo-Saxon, Danish, Swedish, &c. 6. The Celtic, comprising the Welsh, Cornish, Gaelic, Erse, &c. It is evident that these two groups, the Semitic and Indo-European, extend over the whole portion of the globe inhabited by the Caucasian variety; and through European colonists the European branches have extended to America and other parts of the world.

673. In pursuing the study of geography thus far, we have found that the eastern and western continents are distinguished, in their physical nature, by an assemblage of different and opposite characteristics. The Eastern World is the superior in the number of its continents, in the variety and richness of its structure, in its dry and extreme climate, in its excess of animal over vegetable life, in the number and superiority of its races of men, and in its being the primitive seat of civilization. The Western World is the inferior in the simplicity of its forms, in the moisture of its climate, in the preponderance of the vegetable kingdom over the animal, and in its being the domain of the red man.

674. This inequality of the two worlds was only allowed for a while, for, as "all are but parts of one stupendous

---

cation. — 672. The Semitric dialects. The Indo-European. Extent of these two groups. — 673. Characteristics of the Eastern World. Of the Western World. — 674. First impulse to mutual action. — 675. Man. His influence.

whole," there must be mutual relations subsisting between them. The discovery of America by Columbus, in 1492, gave the first impulse to their mutual action through the agency of man. Every thing in nature seemed admirably adapted to carry on the necessary interchange which was to harmonize the relations.

675. Man is eminently a social being, and the more he advances in civilization the greater will be his influence. Scientific discoveries and social combinations, which call into practice great social principles, exert a decided effect in the progress of mankind. Hence we find the cultivated races extending themselves to the uttermost parts of the earth by emigration, colonization, and commerce. The advantages of colonization and commerce to the less civilized portions of the world, as well as to the more highly favored, are incalculable, not only by furnishing an exchange for manufactures, but by the attainment of greater knowledge of the earth and its inhabitants.

676. "Science has never been so extensively and so successfully cultivated as at the present time. The collective wisdom and experience of Europe and the United States of America are now brought to bear upon subjects of the highest importance in annual conventions, where the pursuit of truth is as beneficial to the moral as to the intellectual character. The noble objects of investigation are no longer confined to a few, but are becoming more widely diffused among all ranks of society; and the most enlightened governments have given their support to measures that could not have been otherwise accomplished. Simultaneous observations are made at numerous places in both hemispheres on electricity, magnetism, on the tides and currents of the air and of the ocean, and on those mysterious vicissitudes of temperature and moisture which bless the labors of the husbandman one year and blight them in another.

677. "Vain would be the attempt to enumerate the improvements in machinery and mechanics, the canals and railroads that have been made, the harbors that have been improved, the land that has been drained, the bridges that have been constructed. It would be difficult to follow the rapid course of discovery through the complicated mazes of magnetism and electricity; the action of the electric current

---

Science and society. Progress of the cultivated races. Advantages of colonization and commerce. — 676. Present state of the world. — 677. Progress of the arts and sciences. Of geographical discovery.

on the polarized sunbeam, one of the most beautiful of modern discoveries, leading to relations hitherto unsuspected between that power and the complex assemblage of visible and invisible influences on solar light, by one of which Nature has recently been made to paint her own likeness. It is impossible to convey an idea of the rapid succession of the varied and curious results of chemistry, and its application to physiology and agriculture. Geography has assumed a new character, by that unwearied search for accurate knowledge and truth that marks the present age, and physical geography is altogether a new science. The spirit of nautical and geographical discovery, begun in the fifteenth century, by those illustrious navigators who had a new world to discover, is at this day as energetic as ever. Neither the long, gloomy night of a polar winter, nor the danger of the ice and the storm, deters our gallant seamen from seeking a better acquaintance with this ball of earth, even under its most frowning aspect. The scorching sun and deadly swamps of the tropics as little prevent the traveller from collecting the animals and plants of the present creation, or the geologist from investigating those of ages gone by. Man daily indicates his birthright as lord of the creation, and compels every land and sea to contribute to his knowledge." — [Somerville.]

EXERCISES FOR EXAMINATION.

678. PLANTS. — Is the distribution of plants on the earth's surface a matter of chance or of design?

What is the one only condition fatal to vegetable life?
Which are considered as the most important species of plants?
Into what classes are plants naturally divided?
Describe each class.
Which class includes the greatest number of species?
What is meant by the *flora* of a country?
Where is vegetation most abundant, and why?
Give a description of those regions.
What useful plants belong to the intertropical regions?
What characterizes the vegetation of the temperate climates?
Is there any vegetable production within the limits of perpetual snow?
Which are the first plants that appear at the limits of the snow line?
What description of plants predominates in the arctic regions?

What appearances of vegetation does a high mountain in the torrid zone exhibit?

Where is the *heath* plant indigenous?

Where is the *cactus*?

What effect have mountain chains upon floras?

What is there remarkable in a New England forest in autumn?

For what are the Southern States of the Union remarkable in the vegetable kingdom?

Where is the pineapple indigenous?

What description of plants has been widely disseminated by man's agency?

Mention some particulars as to the origin of some of them.

What is the highest northern limit of the successful cultivation of wheat, oats, and barley in both continents?

ANIMALS.—What is the meaning of *fauna*, as used in zoölogy?

Is there any relation between a fauna and its climate? Between a fauna and a flora?

Mention the four great divisions of the faunas of the earth.

What effect has climate in the polar regions upon animals?

What contrast is remarked in the tropical regions?

What class of animals has the widest range, and why?

What effect have the reliefs of a country upon its faunas?

Is there any limit to the range of marine animals?

Where do migrating animals belong?

Describe the arctic fauna. Its southern limit.

How is the north temperate zone divided?

Give a general description of the temperate faunas.

What remarkable fact is mentioned of the three southern continents?

By what are the faunas of the torrid zone distinguished? Give some particulars.

Mention the four great divisions or departments of the animal kingdom. Describe each.

MANKIND.—Wherein is man distinguished from the rest of the animal kingdom?

What constitutes the chief food of the nations within the tropics? Of the polar tribes? Of those in the temperate regions?

To what do the principal physical differences among mankind refer?

Why are the temperate regions inhabited by the most exalted of the human race?

Mention the varieties of mankind as classified by Blumenbach.

What is Cuvier's classification, and on what is it based?

What part of the earth is considered as the geographical centre of the human family?

What change is perceptible in leaving this centre?

Describe the Caucasian race.

What regions have they occupied, and at present still occupy?

What are the characteristics of the Mongolian race, and what regions do they occupy?

What are the characteristics of the Ethiopian race?

Describe the Malay variety. What regions do they occupy? What is their rank in the scale?

What are the characteristics of the American or Indian race? What portion of the globe do they occupy?

What contrast do the northern and southern continents present in relation to mankind?

Which are the two principal groups of languages?

What languages belong to the Semitic family?

Name the six branches of the Indo-European group of languages.

PART SECOND.

POLITICAL GEOGRAPHY.

CHAPTER I.

PRELIMINARY OBSERVATIONS.

§ 1. POLITICAL GEOGRAPHY DEFINED.

IN POLITICAL GEOGRAPHY the earth is considered as the abode of the human family, among whom its surface is divided, and by whose agency it is subjected to various changes. In its physical aspects the earth remains the same from age to age; or, if there be a change, it is unimportant in a general view. The seas, mountains, rivers, and coasts possess the same prominent features at the present day as in the times of Cæsar, of Solomon, or of Abraham; while the boundaries and extent of nations have been subject to frequent fluctuations, and human society is ever marked by change and revolution.

§ 2. STATES OF SOCIETY.

Man is formed for society. His reason, which distinguishes him from the rest of the animal creation, could never be developed in a solitary state. A nation or people is said to be civilized in proportion as the social relations are extended, regulated, and perfected. Various social conditions combine to produce this improvement; they are literature, the arts, the sciences, and the Christian religion. That which

---

ANALYSIS. — Definition of political geography. Physical geography treats of the permanent; political of the changeable. Man a social being. What is civilization? Conditions necessary to improvement. Foundation of security gives security and permanence to these social conditions is the political organization of society — the government — the STATE. Civilization, therefore, is an improved condition of man, resulting from the establishment of social order in place of the individual independence and lawlessness of a savage or barbarous mode of life.

§ 3. Of Government.

A State is a body of people, united under one government, and is variously denominated a kingdom, a republic, a commonwealth, or a body politic. In every form of government there are *three distinct powers* to be exercised — the legislative, the judicial, and the executive. The *Legislative* is the law-making power, and is sometimes vested in one man; sometimes in a certain number of men, called the legislature, congress, parliament, or diet; and sometimes this power is exercised by the people in general assembly. The *Judiciary* is that branch of the government which is concerned in the trial and determination of controversies between parties, and of criminal prosecutions. This power is usually confided to a distinct class of men called judges. The *Executive*, or power to administer the government, to superintend the execution of the laws, is vested in a president, king, duke, chief, or other titled head of the state. The executive officer is usually assisted in the discharge of his duties by a few persons chosen by himself, and styled his cabinet, council, or ministers.

The three principal forms of government are monarchy, aristocracy, and democracy. A *Monarchy* is a state or government in which the supreme power is vested in a single person. Such a state is usually called a kingdom, or empire. If the prince or ruler of a nation exercises all the powers of government without control, the monarchy is absolute; but if his power is defined by a constitution, or by fundamental laws, the monarchy is limited. In most monarchical governments, the throne is hereditary; that is, it is retained by the reigning sovereign during life, and descends, at death, to a member of the same family. An *Aristocracy* is a form of

---

and permanence. Definition of *civilization*. Definition of *state*. Various terms. Three distinct powers of government. What is the legislative power? what the judiciary? what the executive? Aids to the executive. Three principal forms of government. Monarchy. Monarchy when absolute; limited; hereditary monarchy. Aristocracy. Democracy. Republic. Confederation.

government in which the supreme power is vested in a few of the principal persons of a state, or in a privileged order. A *Democracy* is that form of government in which the people, collectively, exercise the powers of legislation. A pure democracy is rarely found, except in towns or very small communities. A *Republic* is a democratic state, in which the sovereign power is lodged in rulers and representatives elected by the people for a limited term of time. A *Confederation* is a union of several independent states, for mutual aid and defence, under the direction of a general government; as the United States of America, the States of Germany, and of Switzerland.

§ 4. OF RELIGION.

RELIGION, in a general sense, is the reverence of man for some higher power or powers by whom all things are governed. It exists in some form, however gross, in almost every tribe of mankind. The prevailing forms of religion are the Jewish, the Christian, the Mohammedan, and the Pagan.

The *Jews* are descendants of the patriarch Abraham. They worship Jehovah as the true God, receiving only the Old Testament Scriptures as of divine authority. They expect the Messiah is yet to come. As a nation they have no country of their own, but are dispersed throughout all nations, yet remaining a distinct and peculiar people. In many countries they do not enjoy the common privileges of citizenship.

Christians are those who believe in Jesus of Nazareth as the Christ, the Messiah of God. They acknowledge the Scriptures of the Old and New Testaments as of divine authority, and as their guide in faith and worship. There are three great divisions of Christians — the Eastern or Greek church, the Roman Catholic, and the Protestants. They differ from each other in peculiarities of doctrine and modes of worship.

Mohammedans are those who receive the Koran, or sacred book of Mohammed, as their guide in religion. Its author was an Arabian impostor, who lived about 600 years after Christ, and pretended to be the inspired prophet of God. All that is good in the Koran he drew from the Bible; the remainder is his own invention. The Turks, Persians, Arabians,

---

Definition of religion. Four prevailing forms. Jews. Christians. Three great divisions of the Christian church. Mohammedans. The Koran. People of the Mohammedan faith. Paganism. Principal systems of paganism.

and Egyptians profess the Mohammedan faith. This form of religion is more correctly called Islamism.

Paganism is the worship of idols, or false gods. It comprises many systems, of which Bräh′minism, Bŭddh′ism, and Fet′ichism are the principal.

Among the widely differing estimates of the population of the globe, the following is sufficiently accurate for comparison:—

North America,	35,000,000
West Indies,	3,800,000
South America,	19,000,000
Europe,	263,500,000
Asia,	626,000,000
Africa,	68,000,000
Australia, including Oceanica,	3,000,000
Total,	1,018,300,000

Population according to the races of mankind:—

Caucasian,	520,000,000
Mongolian,	422,100,000
Ethiopian,	56,000,000
Malay,	8,200,000
American,	12,000,000
Total,	1,018,300,000

Population according to the religions of mankind:—

Jews,	3,679,000
Christians,	261,921,000
Mohammedans,	178,325,000
Pagans,	574,375,000
Total,	1,018,300,000

CHAPTER II.

DIVISIONS OF NORTH AMERICA.

§ 1. PEOPLE AND COUNTRIES.

THE present population of North America consists of the white descendants of different European nations, negroes, Indians, and mixed races. The origin of the Indian race is unknown. It is certain, however, that this continent was inhabited by a people who lived long before the present races or tribes, and concerning whom neither history nor tradition have preserved any very satisfactory record. Many evidences remain to prove the fact of their having existed, and that they had attained to a degree of civilization far superior to the present Indian race. Among these evidences are the remains of elaborately sculptured edifices, and medals of copper and silver. The various tribes of America, excepting the Esquimaux, bear a strong resemblance to each other in physical formation, and thus indicate a common origin. Their peculiar characteristics have already been noticed on page 211, in Part I. They have been considered as an inferior race intellectually; yet instances of advancement are not wanting, especially of those tribes occupying the Indian Territory of the United States, where they have attained a station in advance of all other known tribes. A large portion of North America is still in possession of the Indians, comprising the northern parts of Mexico, the western parts of the United States, and the N. W. parts of British America. Their entire numbers are estimated at more than half a million.

The Caucasians who have settled in America belong chiefly to the nations of Western Europe. The Spaniards colonized Mexico and Florida; the English the eastern portions of the continent from Florida northward; the French

---

Inhabitants of North America. The aborigines. Indian tribes. Parts colonized by the Spaniards. English. Danes. French. Dutch. Others.

were the first settlers of the Valleys of the St. Lawrence and Mississippi. Numerous Dutch colonists settled at New York and New Jersey; and to all these have been added Swedes, Germans, Swiss, Scotch, and Irish in great numbers. From such materials the great Anglo-American family has been formed, which is now rapidly spreading over all the habitable portion of North America.

North America, including Central America, is politically divided into a number of independent states, and the colonial possessions of several European nations. These are, the Danish Possessions, French Possessions, Russian Possessions, British America, the United States of America, Mexico, and the States of Central America.

§ 2. Danish Possessions.

Area in square miles, 180,000. Population, 9400.

Greenland and Iceland form the chief part of the possessions of Denmark in North America. Greenland lies N. E. of the continent, having Baffin's Bay and Davis's Straits on the west, and the Atlantic Ocean on the east; Cape Farewell, in 59° 49′ N. lat., is its most southerly point; the northern limits are unknown. The whole country is high and rocky. The eastern shore, north of the 65th parallel, is an impenetrable barrier of ice. The western shore is high, rugged, and barren, and rises close to the water's edge in cliffs and mountains. The coast is indented with bays or fiords, and interspersed with islands, of which Disco is the largest. The coasts and islands are the only habitable parts.

Vegetation is almost suspended by reason of the intensely cold climate. In these high latitudes there is no night in summer and no day in winter. Coal is obtained on the Island of Disco. Among the animals are the reindeer, polar bear, white hare, fox, and dog. Seals abound on the southern coasts, and the sea, rivers, and fiords are plenteous in fish. Fishing and sealing form the principal occupation of the inhabitants. *Groot Haab* is the capital.

In West Greenland there are thirteen colonies, fifteen minor commercial establishments, and ten missionary stations: the most northerly of the latter is Uppernā′vik, in 73° 20′ N.

Result of this admixture. Political divisions of North America. Greenland. Its physical aspects. Coast. Vegetation. Day and night. Coal. Animals. Occupation. Colonies in West Greenland. Exports. Imports.

lat., and the most southerly is Julianshaab, in 61° 30′ N. lat. The exports are whale oil, seal, bear, and reindeer skins, and eider down; the imports are woollens, blankets, coffee, and spirits. The number of inhabitants is about 9400, the Danes and Norwegians constituting nearly one half. The Moravian missionaries have been very successful in converting the natives to Christianity.

ICELAND is a large island, situated between 63° and 67° N. lat., and about 480 miles E. of Greenland, having an area of about 30,000 square miles, and 56,000 inhabitants. It is of volcanic formation, and is traversed by two ranges of Ice Mountains, of which the Orafajokel is the highest, being 6405 feet. The volcano of Hecla, in the S. W. part of the island, is 5110 feet high, and is remarkable for the frequency of its eruptions. The general aspect of the country is rugged and extremely desolate. The Geysers, or hot springs, form the chief wonder of this island, and are used by the natives for culinary purposes. The fisheries are extensive, and large quantities of pickled fish are exported, as also wool, skins, and moss. The chief town is *Reikiä′vik,* situated on the S. W. coast.

§ 3. FRENCH POSSESSIONS.

The only places held by the French in North America are the Islands of St. Pièrre′, Grand Miquelon′, and Petit Miquelon′, which lie S. W. of Newfoundland. They are used only as fishing stations for French vessels.

§ 4. RUSSIAN POSSESSIONS.

Area in square miles, 371,000. Population, 10,000.

This territory comprehends the N. W. portion of the continent, extending from Behring's Strait eastward as far as the meridian of Mt. St. Elias, 140° 52′ W. lon., and from this summit south-eastward along the coast chain of hills, till it reaches the coast in 54° 40′ N. lat., forming an area of about 371,000 square miles. Several extensive islands along the coast are included in the Russian territories, the chief of

---

Population. Missionaries. Iceland. Volcanic formation. Hecla. Hot springs. Trade. Chief town. French Possessions. Russian Possessions.

which are Kodiak, Sitka, Admiralty, and Prince of Wales. The chief town is *New Archangel,* on Sitka Island. The people are mostly savages. A few Russians reside in the country, who are engaged in the fur trade.

§ 5. BRITISH AMERICA.

Area in square miles, 2,925,250. Population, 2,758,460.

BRITISH AMERICA comprises an extensive territory, occupying the northern portion of the continent, between the great lakes and the Arctic Ocean, and extending from the Atlantic to the Pacific. It comprises New Britain, or Hudson Bay Territory, and the provinces of Canada, New Brunswick, Nova Scotia, Newfoundland, and Prince Edward's Island. Each province has a governor and council appointed by the British government, and a legislature chosen by the people. A governor general is also appointed.

NEW BRITAIN, or HUDSON BAY TERRITORY, is a vast region, extending from Baffin's Bay and Davis's Straits on the east to the Pacific Ocean and Russian Possessions on the west, and from the northern line of Canada and the 49th parallel far into the polar regions. It is chiefly a tract of ice and snow in the northern department; but in the southern portion, along the shores of the lakes, it is swampy; while more inland it is well wooded. It produces the fur-bearing animals in great abundance. It is used by the "Hudson Bay Company," which was chartered by Charles II. in 1670, merely as hunting grounds, from which to obtain supplies of furs for the markets of the world. There are probably upwards of twenty different kinds of furs, the most valuable of which is that of the black fox. The other articles of commerce are oils, dried and salted fish, feathers, quills, and walrus ivory. Area, 2,480,000 square miles. Population, 180,000. Capital, *York Fort.*

CANADA occupies a long, narrow tract of country, extending south-westward from the Atlantic, along both sides of the St. Lawrence River, as far as 45° N. lat., and thence westward on the northern shores of Lakes Ontario, Erie, Huron, and Superior, comprising an area of 350,371 square miles. Population, 1,842,265. It is intersected by a number of

---

Extent. Islands. Chief town. British America. Divisions. Government. New Britain. Hudson's Bay Company. Condition of the country. Canada. Extent. Physical aspect. Region of its settlements. People of Canada East.

mountain ridges extending from the coast into the interior; and between these lie extensive and fertile valleys. The most flourishing and populous settlements in the country are chiefly on the rivers and along the shores of the great lakes. This country was formerly divided into the two provinces of Upper and Lower, but is now politically united, though still differing in laws, customs, and manners. The people of Canada East are chiefly of French origin, but those of Canada West are British. The French Canadians are all Roman Catholics.

The commerce of this province has steadily increased in extent and importance, and is principally carried on through the ports of Quebec, Montreal, and St. John. The exports are timber, grain, ashes, furs, and fish. Two extensive lines of canal — the *Rideau*, connecting Bytown and Kingston, to avoid the rapids in the St. Lawrence; and the *Welland*, from the S. W. of Lake Ontario to Lake Erie, to avoid Niagara Falls — are among the most useful works in Canada.

Quebec, the capital, is situated partly on a bold, rocky headland, rising 350 feet above the northern bank of the St. Lawrence, between it and the St. Charles, and partly on the narrow margin of the river below the rock. The principal part of the upper town is enclosed with fortifications which are considered impregnable. Quebec is situated about 340 miles from the Gulf of St. Lawrence, and is accessible to the largest ships. Lat. 46° 49′ 12″ N., lon. 71° 15′ 45″ W. Distance 317 miles N. of Portland, Maine, 169 miles N. E. of Montreal.

Montreal is the largest and most populous city and chief seat of commerce of British America. Its position at the head of the ship navigation of the St. Lawrence, and near its confluence with the Ottawa, as well as its situation with respect to the cities of New York and Boston, necessarily renders it one of the greatest emporiums of Canada. It is situated on Montreal Island, in the River St. Lawrence, 169 miles above Quebec, in 45° 30′ N. lat., and 73° 25′ W. lon.

Kingston is situated at the N. E. extremity of Lake Ontario, on the site of the old Fort Frontenac. Its harbor is well sheltered, and contains the royal naval station on the lakes. Toronto, lately the capital of Upper Canada, is situated on a fine harbor towards the western extremity of Lake Ontario. The banks of the St. Lawrence between Montreal

---

Of Canada West. Commerce. Canals. Quebec. Montreal. Kingston. Toronto. Banks of the St. Lawrence River. New Brunswick. Location of set-

and Quebec are lined with numerous pretty villages, which are rendered conspicuous by their large stone churches, with shining, tin-covered roofs and spires.

New Brunswick.—This province consists of an extensive tract, comprising 27,700 square miles, the greater part of which is still covered with magnificent forests; population, 193,800. It is bounded on the N. by the Bay of Çhaleurs′ and the Restigouçhe′ River; S. by the Bay of Fundy; E. by the Gulf of St. Lawrence; and W. by Lower Canada and the State of Maine. The principal settlements are along the St. John's River and its lakes. Lumber and fish are the chief articles of export. *St. John*, the largest town in the province, and the seat of an extensive trade, is on the river of the same name, near its mouth; and 85 miles above it is *Fredericton*, the capital.

Nova Scotia peninsula, with the Island of Cape Breton, together form one province, which is bounded N. by the Gulf of St. Lawrence, E., S., and W. by the Atlantic Ocean, and N. W. by the Bay of Fundy. Area, 18,746; population, 216,117. An isthmus 9 miles wide connects the peninsula with New Brunswick. The Bay of Fundy is very peculiar; its shores on both sides are rocky and abrupt; while near its head the tide, pressed and confined within diminished limits, rushes with much violence over extensive and wide-spread mud flats, and rises 60 feet or more perpendicular. The fisheries are valuable and extensive. *Halifax*, the capital of the province, is pleasantly situated on a slope of ground facing a fine spacious harbor, on the eastern side of the peninsula. It is the chief naval station of Great Britain in North America, and is the British North American station for the Cunard line of steamers, which run between New York, Boston, and Liverpool. Among the other noted places in this province is Annapolis, on the Bay of Fundy; it is the oldest settlement in North America, which was founded by the French in 1604. Pictou and Sydney are noted for their mines of bituminous coal.

Newfoundland.—This is a large and valuable island, situated off the S. E. coast of Labrador, from which it is separated by the Strait of Belleisle, 12 miles across. It contains a surface of 35,913 square miles, is very irregular in its outline, its shores being greatly indented. The chief re-

---

tlements. St. John. Fredericton. Nova Scotia, and Cape Breton Isle. Boundaries of Nova Scotia. The Bay of Fundy. Halifax. Annapolis. Pictou. Sydney. Newfoundland. Fisheries. St. John's. Most noted fishing ground. Prince Edward's Isle. Capital.

sources of the population are in the cod, seal, and salmon fisheries, for which it has been long celebrated. The principal fishing grounds are off the S. E. coast, called the Grand Banks. *St. John's*, the capital, is in the S. E. part of the island. Population of the island, 101,600.

PRINCE EDWARD'S ISLAND. — This is a fine fertile island, lying in the Gulf of St. Lawrence, north of Nova Scotia and New Brunswick, from which it is separated by Northumberland Strait. The climate is milder than that of the surrounding British colonies. The soil is fertile, yielding large crops of grain. Area, 2134 square miles; population in 1848 was 62,678. Charlottetown is the capital.

SUGGESTIONS TO THE TEACHER.

VOYAGES AND TRAVELS, performed in imagination by means of maps, are admirably adapted to make the study of geography of practical utility. In describing voyages, the pupils should be required to mention the waters sailed through, the general courses, the islands, coasts, and other prominent objects successively passed, whether on the high seas or coastwise. In travels and transportations inland, whether by railroad, steamboat, or canal, they should specify the direction, distance, and the chief places which are passed on the routes; and the teacher should communicate such additional information in connection with the several places as may serve to aid the memory by the principle of association. Then, as a valuable means for testing the knowledge of a class in topography, narrate to them, with as much minuteness of detail as may be necessary, a voyage or journey, *carefully omitting the names of the places*, but at the same time requiring the pupils to note down the names in succession which your narrative may suggest.

1. As an example of a voyage, take the following: Describe a voyage from New York to Aspinwall and back, in a steamship. We sail through the "Narrows" into the Atlantic Ocean, and, when we are sufficiently far from the coast, we shape our course southerly for the eastern part of the Bahamas to avoid the Gulf Stream, and pass between Acklin and Inagua Islands, then through the windward passage which separates Cuba from Hayti, and touch at Kingston, Jamaica, having sailed 1640 miles; from Kingston we sail S. S. W. across the Caribbean Sea, 575 miles, to Aspinwall, on the Isthmus of Panama, the whole distance being 2215 miles. Leaving Aspinwall for the homeward voyage, we take a N. N. W. course through the Caribbean Sea and Yucatan Pass, and round Cape St. Antonio, eastward, to Havana, the capital of Cuba, having sailed 1075 miles; from Havana we proceed northerly through Florida Pass, and along the coast

of the United States, to Sandy Hook and New York harbor, a distance of 1260 miles from the last port, making the return route 2335 miles.

2. The following is an example of steamboat and railroad travelling: A trip from Pittsburg, Pennsylvania, to Sandusky city, Ohio. We will now step on board one of the many beautiful steamboats which crowd the landing at Pittsburg, and proceed down the Ohio River. Our first stopping place is Steubenville, one of the most flourishing towns on the river; thence we proceed to Wheeling, Virginia, which is situated in the centre of an area, 100 miles diameter, of the most fertile soil any where to be found. We next stop at Marietta, one of the first settled towns in Ohio; and thence to Portsmouth, at the terminus of the Ohio Canal, where we find extensive iron factories, and people busily engaged in receiving and forwarding produce and merchandise. Our next place of landing will be at Cincinnati, where we shall leave the boat and take the cars for the remainder of our journey. Cincinnati is the largest and most commercial city west of the Alleghanies, containing more than 160,000 inhabitants. It is laid out with great regularity, and occupies a portion of two table lands, one elevated from 40 to 60 feet above the other. Steamboats are constantly leaving for Pittsburg, Louisville, St. Louis, New Orleans, and other places, freighted with produce from the interior.

We will now take the cars for Sandusky city. On our route we pass through a beautiful country, abounding in well-cultivated farms, with extensive fields of wheat and corn. At Xenia there is a railroad which passes through Columbus, the capital, to Zanesville. Keeping on in our intended route, we pass through Springfield, Urbana, Bellefontaine, Kenton, and other places, to Sandusky city, which is one of the principal ports on Lake Erie.

3. A narrative of a journey without naming the places visited: "On a small island at the mouth of a beautiful river is a very important commercial city. At its wharves ships of all nations may be found, discharging or receiving their cargoes, and its merchants hold intercourse with every part of the known world. Many who do business in this city reside in another city, a little to the east, and on the western extremity of a fine island. If we should ascend the river we should pass through a beautiful region of country, noted for its wild and romantic scenery, and should see at our left a place from which floats the American flag, to indicate that it is occupied as a military station. It was here that, a long time ago, in the days of the revolution, a man holding a high rank in the army arranged a plan to surrender to the enemies of his country the important position which had been committed to his command. And it was in attempting to pass from this place to the British army, that a young and gallant British officer, with the despatches of the traitor in his possession, was arrested by men, who, though poor in purse, were too steadfast in their integrity to be bribed or bought with gold. Here, too, have been educated some of the bravest officers now in the American army, and some of the most able engineers and scientific men of whom our country can boast. Sailing farther up the river, through a pleasant and fertile country, but much less elevated than that we have left, and passing several pleasant towns and villages, we come to a city which was first settled by the Dutch, and still contains many of their descendants. It is a beautiful city, is the capital of

a large state, and is the terminus of a noted canal, once regarded as one of the most remarkable works of the kind in the world. Nearly parallel with this canal runs a railroad, and over both are every year transported immense quantities of grain, flour, provisions, and merchandise of all kinds which are produced or consumed in the surrounding country, or even in the far west. Above the last-named city, and on the same river, is another beautiful city, that bears the name of one which, centuries ago, when people believed that the gods would come down to take part in the battles of men, was besieged for ten long years, and at last was taken only by stratagem.

Now, what city did I first describe? What name is sometimes applied to it on account of its size and importance? On what island is it? At the mouth of what river? What city to the east of it? It is sometimes called the "City of Churches." Why? As we ascend the river, what mountains do we pass? What military station? What institution there? Who attempted to give this up to the British? When? Why? With what success? What British officer is referred to? What was his fate? What became of the commanding officer of the fort, and by what name has he since been known? Why is this place so important as a military station? What towns and villages above this on the river? At what city did we arrive? Describe it. What city a little to the north of it? What ancient city is referred to? What distinguished characters and heroes of antiquity took part in the siege? By what stratagem was the city taken? What was the cause of the siege? What canal is mentioned? What places does it connect? &c., &c.

CHAPTER III.

THE UNITED STATES OF AMERICA.

§ 1. General Observations.

Area in square miles, 3,384,865. Population in 1850 was 23,191,876.

The United States of America is a confederacy of sovereign states, occupying the middle portion of North America, between 24° and 49° N. lat., and 67° and 125° W. lon., extending from the Atlantic to the Pacific Oceans, and from the British Possessions on the north to the Mexican republic and the Gulf of Mexico on the south. The greatest length from east to west is 2800 miles; its breadth from north to south is 1900 miles; frontier, 11,000 miles, of which 4400 miles is sea coast and 1600 lake coast. The whole area is estimated at 3,384,865 square miles. The Union originally consisted of thirteen states, but now of more than thirty, together with the federal district, and several territories.

The country is naturally divided, by the Rocky Mountains and the Alleghanies, into three distinct regions; the Atlantic declivity on the east, the basin or Valley of the Mississippi, in the middle, and the Pacific declivity on the west. The Atlantic border is indented with many important bays and sounds; there are but few on the Gulf coast, but on the west coast there are several excellent bays, that of San Francisco being one of the finest in the world. Only two of the great lakes lie wholly within the limits of the United States; they are Michigan′ and Champlain′.

The rivers of the United States may be divided into four classes: 1. The Mississippi and its wide spreading tributaries, which drain nearly the whole country between the mountain

---

Government of the United States. Extent. Length. Breadth. Area. Frontier line. Natural divisions of the country. Indentations. Great lakes.

chains; 2. The rivers east of the Alleghanies, which water the Atlantic terrace and lowlands, and thence flow into the ocean; 3. The rivers flowing into the Gulf of Mexico, independent of the Mississippi; and 4. The rivers on the western slope of the Rocky Mountains which flow into the Pacific. In a country so extensive and diversified there must necessarily be a variety in soil and climate.

The United States rank next to Great Britain in commercial enterprise. The foreign, coasting, and inland trade are all on an extensive scale. The domestic commerce may be divided into three branches: 1. That which is carried on coastwise, up the bays and large rivers, and on the great lakes, by schooners, sloops, and steamboats; 2. That which is carried on chiefly in steamboats, but partly in flat bottom boats on the tributaries of the Mississippi; 3. The overland trade between the Western and Atlantic States, by canals and railroads.

The mineral resources of the United States are abundant and various. Coal, iron, copper, lead, and gold are inexhaustible; as also granite, sienite, marble, sandstone, and breccia for building purposes. Although the industry of the country is at present chiefly applied to agriculture, the progress of manufactures is daily increasing, and extending their limits to every part of the nation.

The *Government* of the United States, as established by the Constitution of 1787, consists of a legislative, an executive, and a judiciary department. The legislature is termed the "*Congress of the United States of America*," and consists of a Senate and House of Representatives. The Senate is composed of two members from each state, chosen by the several state legislatures, for a term of six years. The House of Representatives is composed of members from the states, elected by the people, for a term of two years. The number of members from each state is in accordance with the population of each.

The *Executive* power is vested in a President, who, with the Vice President, is chosen for four years, by "Electors" from all the states. Each state appoints as many electors as it has members of Congress. The executive business of the nation is conducted by several officers who constitute

---

Four classes of rivers. Diversity of climate, &c. Commerce of the United States. Three branches of domestic commerce. Mineral resources. Industry. Government under the Constitution. Congress. Senate. House of Representatives. Executive. Election of President and Vice President. The Cabinet. Secretaries, &c. Vice President. Judicial power. Judges, how ap-the President's cabinet. These are, the Secretary of State, Secretary of the Treasury, Secretary of War, Secretary of the Navy, Secretary of the Interior, Postmaster General, and the Attorney General, each of whom presides over a separate bureau′ or department. The Vice President is the presiding officer of the Senate.

The *Judiciary* power of the United States is vested in one Supreme Court, and such inferior courts as Congress may, from time to time, establish. The judges are nominated by the President, approved by the Senate, and hold their office during good behavior.

There is no national or established religion in the United States; for it is expressly declared in the Constitution, that "Congress shall make no law respecting the establishment of religion, or prohibiting the exercise thereof." Every citizen is free to choose his own faith; but the mass of the people adhere to Christianity, in some one or other of its forms.

The general interests of the nation are confided to the general government; but each state has a government of its own, with the exclusive control of its own local affairs. The territories are under the jurisdiction of the general government.

§ 2. The District of Columbia.

This District formerly comprised an area of territory ten miles square, on the banks of the Potomac River, about 120 miles from its mouth. It was originally ceded to the United States by Virginia and Maryland, for the purpose of establishing therein a federal capital and a seat for the general government. In 1846, the portion on the Virginia shore of the Potomac was retroceded to that state, so that now the District comprehends only the Maryland portion, in which are situated the cities of Washington and Georgetown.

The City of Washington, the federal capital and seat of the general government, is situated on the east bank of the Potomac River, in 38° 52′ 43″ N. lat., and 76° 55′ 30″ W. lon. It is laid out on an extensive and regular plan, but only a small portion of it is yet occupied by buildings. It con-

---

pointed. Constitutional law with regard to religion in the United States. Of the general and state governments. Of the territories. District of Columbia. Formerly. At present. The capital. Plan of the city. Public

tains the Capitol, the President's House, the edifices for the State, Treasury, War, and Navy Departments, the General Post Office, Patent Office, Smithsonian Institute, and Navy Yard. Washington is connected with the north, south, and west by railways, and is accessible from the Atlantic for ships of the largest class.

§ 3. SECTIONS OF THE UNITED STATES.

The states and territories of the Union are divided into five sections: the Eastern or New England States; Middle States; Southern States; Interior States; and Pacific States.

1. *New England.*

Maine, New Hampshire, Vermont,
Massachusetts, Rhode Island, Connecticut.

2. *Middle States.*

New York, New Jersey, Pennsylvania,
Delaware, Maryland.

3. *Southern States.*

Virginia, North Carolina, South Carolina,
Georgia, Florida, Alabama,
Mississippi, Louisiana, Texas.

4. *Interior States and Territories.*

Ohio, Indiana, Illinois,
Michigan, Wisconsin, Iowa,
Missouri, Arkansas, Kentucky,
Tennessee, Minnesota Ter., Nebraska Ter.,
Kansas Ter., Indian Ter.

5. *Pacific States and Territories.*

California, New Mexico Ter., Utah Ter.,
Oregon Ter., Washington Ter.

Buildings. Communication with the city. Five sections of the United States and territories. —NEW ENGLAND. For what noted? People. Churches and

EXERCISES IN VOYAGES AND TRAVELS.

Describe a voyage from Boston to New Orleans. New Orleans to Havana. Havana to Norfolk. Norfolk to Montreal. Montreal to Halifax. Halifax to Mobile. Mobile to Vera Cruz. Vera Cruz to Kingston, Jamaica, and from thence to Pensacola. From Pensacola to New York. New York to Port-au-Prince. Port-au-Prince to Galveston. Galveston to Quebec. From Quebec to Natchez. Natchez to Chagres. Describe the journey from Chagres to Panama; and the voyage from Panama to San Francisco.

§ 4. THE EASTERN OR NEW ENGLAND STATES.

NEW ENGLAND is that portion of the United States lying east of the State of New York, and comprises six states: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut. This section is noted as being the most intelligent, industrious, and thriving portion of the Union. The people are benevolent and hospitable, conscientious in their worldly affairs, honest, and honorable. Their churches and school houses indicate their great principles — religion and education. In no other country has education been more developed. This is the great manufacturing district of the Union; hence its rapid increase in wealth and population. It is also extensively engaged in the whale and other fisheries, giving employment to more than 35,000 men. The commerce of New England is very extensive. The soil of this section is better suited to grazing than to grain. Beef, pork, butter, and cheese are among the important productions.

Boston is regarded as the commercial metropolis of New England. It occupies a peninsula at the head of Massachusetts Bay, and is encircled and immediately connected with the cities of Roxbury, Cambridge, and Charlestown, and the towns of Chelsea, Brighton, Brookline, and Dorchester. East and South Boston form a part of its municipality. It is the focus of the railroad system of New England; and, from the proximity and influence of Harvard University, it is styled the "Literary Emporium," — the "Athens of America." New Bedford on Buzzard's Bay, Providence on Narragansett Bay, and Portland on Casco Bay, are also important com-

---

school houses. Manufactures. Fisheries. Commerce. Soil. Productions. Boston. Commercial towns. Manufacturing places. Railroad centres. — MAINE.

mercial cities in New England. Lowell, Massachusetts, on the Mer′rimack River, is one of the largest manufacturing places in America. Worcester, Springfield, Pittsfield, Groton, Andover, and Keene are noted railroad centres.

§ 5. MAINE.

Extent, from 43° 5′ to 47° 20′ N. lat., and from 66° 49′ to 71° 4′ W. lon. Area, 32,628 square miles. Population, 583,169.

MAINE is the largest of the New England States. It is bounded on the N. W. and N. by Canada East; E. by New Brunswick and the St. Croix River; S. by the Atlantic Ocean; and W. by New Hampshire. It was first settled in 1626. The province was taken under the jurisdiction of Massachusetts in 1656, and so continued until 1820, when it was separated, and became an independent state.

In the north and north-west the country is mountainous, and has a poor soil. Throughout the interior it is generally hilly, and the land rises so rapidly from the sea coast, that the tide in the numerous rivers flows but a short distance inland. The best land in the state is between the Penŏb′scot and Kennebĕc′ Rivers, where it is excellent. There are numerous lakes in this state, which abound in fish, and multitudes of streams and rivers that afford many excellent mill seats. The coast is lined with islands, and indented with numerous bays and inlets, which furnish more good harbors than are found in any other state in the Union. The Penŏb′scot and Căs′co Bays are magnificent and of great extent. Other bays are Frenchman's, Englishman's, Machī′as, and Passamaquŏd′dy. The highest mountain summit is Mount Katäh′din, in Piscăt′aqua county. The principal rivers are the Penŏb′scot, Kennebĕc′, Androscŏg′gin, Sâ′co, Sălm′on Falls, Piscăt′aqua, St. Croix, and the St. John's. The most noted lakes are Moosehead, Um′bagog, Sebā′go, Schôô′dic, and Chesŭn′cook. The chief islands are Mount Desert, Deer, Long, Boon, and Fox. Extensive forest hills, covered with the finest of pine and other timbers, traverse the state in every direction. The great staple productions are lumber, granite, and lime.

Augusta, the capital of the state, lies on both sides of the Kennebec River, 43 miles from its mouth. The two parts of the town are united by a handsome stone bridge. Lat.

Extent. Area. Population. Comparison. Boundaries. First settled, &c. Physical aspects. Waters. Mount Katahdin. Rivers. Lakes. Islands. For-

44° 18′ 43″ N., lon. 69° 50′ W. Distance 595 miles N. E. from Washington.

Portland is the largest and most important city in the state. It is finely situated on an elevated peninsula projecting into Cas′co Bay. The harbor is deep, safe, spacious, easily accessible, and always open. Population in 1850, 20,815. It is 542 miles N. E. from Washington.

Bangor, on the Penob′scot, 60 miles from the sea, is one of the pleasantest situated and most elegantly built cities in the Union. Its coasting trade is superior to most of the northern ports. Population, 14,432. It is 661 miles from Washington.

Brunswick, on the Androscog′gin, is the seat of Bowdoin College. At Orō′no, Machī′as, and Căl′ais there are numerous saw mills, employed in sawing logs into boards and planks. From Belfast, Bath, Wiscas′set, and other places, immense quantities of lumber and firewood are shipped to other ports in the Union, and to the West Indies. Thomaston and Camden export lime.

§ 6. NEW HAMPSHIRE.

Extent, from 42° 41′ to 45° 11′ N. lat., and from 70° 40′ to 72° 28′ W. lon. Area, 9411 square miles. Population, 317,976.

NEW HAMPSHIRE is bounded N. by Canada East; E. by Maine; S. E. by the Atlantic; S. by Massachusetts; and W. by the Connecticut River, which separates it from Vermont. The mountains, lakes, valleys, and cataracts of New Hampshire abound in sublime and beautiful scenery, and have acquired for it the title of the " Switzerland of America." It is also called the " Granite State." The White Mountains, which are of much celebrity, lie in the northern and eastern portion of the state, and are the loftiest in New England. Mount Washington, the highest summit, is 6226 feet in height. The " Notch " in these mountains is regarded as a great natural curiosity; it is a deep chasm, affording a passage through which the Sâ′co River runs. Other peaks are Moosehillock, Grand Monăd′nock, and Kēar′sarge.

Among the beautiful lakes in this state are Lake Um′bagog, on the eastern line, and Winnipiseo′gee Lake, near the centre, a highly picturesque body of water 22 miles long, and containing a number of romantic islets. The chief rivers are

---

ests. Augusta. Portland. Bangor. Other towns. — NEW HAMPSHIRE. Extent. Area. Population. Boundaries. Scenery. White Mountains. Mount Washington. The Notch. Other peaks. Lakes. Rivers, &c. Extent of

the Connecticut, Mer′rimac, Androscog′gin, Salmon Falls, Piscat′aquâ, Sâ′co, Ammonôô′suc, and Ashuē′lot. The only islands of note are the "Isles of Shoals," off Portsmouth harbor. New Hampshire has only 18 miles of sea coast, and Portsmouth is its only harbor.

Concord, the capital, lies on both sides of the Mer′rimack River, which is spanned by two bridges. Lat. 43° 12′ 29″ N., lon. 71° 29′ W. Distance 474 miles N. E. from Washington.

Portsmouth, near the mouth of the Piscat′aquâ, is the largest and most commercial town in the state. Its harbor is unsurpassed, being capacious, safe, easily defended, and deep at the lowest tides. A United States navy yard is located here. Distance 491 miles N. E. from Washington.

Hanover, on the Connecticut River, is the seat of Dartmouth College. Exeter, in the S. E. part of the state, is the seat of Phillips Academy, one of the oldest and most respectable in New Hampshire. Dover and Great Falls are noted manufacturing places. Francō′nia is celebrated for its iron works.

§ 7. VERMONT.

Extent, from 42° 50′ to 45° N. lat., and from 71° 33′ to 73° 25′ W. lon. Area, 10,212 square miles. Population, 314,120.

VERMONT is bounded on the N. by Canada East; E. by the Connecticut River, which separates it from New Hampshire; S. by Massachusetts; W. by New York, from which it is partly separated by Lake Champlain. This state lies wholly inland. It takes its name from the Green Mountains, so called by the French from the evergreens which cover them. Vermont is more of an agricultural than a manufacturing or commercial state, and is noted for its excellent pasturage, affording subsistence to numerous flocks of sheep and herds of cattle. Wool is the staple production. Large crops of corn, wheat, and oats are cultivated in the Connecticut valley. The chief rivers are the Connecticut, Lamoile′, Onion, Missīs′que, White, and Otter Creek. The principal islands are North and South Hero, and La Motte, all of which are in Lake Champlain.

Montpē′lier, the capital, is on the Onion River, in the northern interior of the state. It is in 44° 17′ N. lat., and

---

coast. Concord. Portsmouth. Hanover. Exeter. Dover, &c. — VERMONT. Extent. Area. Population. Boundaries. Place. Name. For what noted. Productions. Rivers. Islands. Montpelier. Burlington. Other towns. — MAS-

72° 36′ W. lon. Distance 524 miles N. N. E. of Washington. *Burlington*, on Lake Champlain, is the largest town in the state, and one of the handsomest in New England. Its harbor is one of the best on the lake, and is of easy access. Vermont University is located here. Some of the other principal places are Middlebury, the seat of a college; Bennington, a battle ground in 1777; Brattleboro', in the S. E., on the Connecticut; and Norwich.

§ 8. MASSACHUSETTS.

Extent, from 41° 23′ to 42° 52′ N. lat., and from 69° 50′ to 73° 30′ W. lon.
Area, 7500 square miles. Population, 994,514.

MASSACHUSETTS is bounded on the N. by Vermont and New Hampshire; E. by the Atlantic Ocean; S. by the Atlantic, Rhode Island, and Connecticut; and W. by New York. This is the oldest, wealthiest, and most populous of the New England States, and is the most densely settled state in the Union. The people are noted for intelligence, liberality, energy, and enterprise. Though one of the smallest states, it is among the first in agriculture, manufactures, and commerce. Its colleges and public and private schools are numerous, and rank among the best in the Union.

The face of the country is diversified. There are several ranges of mountains in the western part of the state, which are a continuation of the Alleghanies. They run along the western boundary under the names of the Taghkăn′ic and Hôô′sac ridges, passing into Vermont as the Green Mountains. Saddle Mountain, 3900 feet high, is the most elevated peak. The White Mountains of New Hampshire range this state in the region of the Connecticut River. Their highest summits within this state are Mount Tom and Mount Hol′yoke, the Connecticut River flowing between them; and Wachusett, a single peak south of Fitchburg. The middle and north-eastern parts of Massachusetts are hilly and broken. In the south-eastern counties the land is level and sandy. On the sea coast the soil is generally poor, but the rest of the state has a strong, good soil, well adapted to grazing and grain.

The chief rivers of this state are the Connecticut, Merri-

SACHUSETTS. Extent. Area. Population. Boundaries. Compared with other states. People. Means of education. Mountains. Middle and north-eastern parts.—South-eastern counties. Soil. Rivers. Bays. Islands. Valmack, Concord, Nashua, Ipswich, North, Saugus, Charles, Mystic, Neponset, Taunton, Chicopee, Deerfield, French, and Hoosatonic. The principal bays are Massachusetts, Buzzard's, Barnstable, Plymouth, and Cape Cod. And the most noted islands are Nantucket, Martha's Vineyard, Elizabeth, Plum, and those in Massachusetts Bay.

The valleys of the Connecticut and Housatonic, especially, have a fine soil, and embrace many flourishing and pleasant towns. The farms around Boston are literally gardens, from which the city is supplied with the finest fruit and vegetables. The principal agricultural productions are grass, Indian corn, rye, wheat, oats, and potatoes. Beef, pork, butter, and cheese are abundant and of excellent quality. Among the mineral products are iron ore, which is found in large quantities in Bristol and Plymouth; marble and limestone, in Stockbridge, and other places in Berkshire county; granite and sienite, in great quantities, are quarried at Quincy, Chelmsford, and other places.

Massachusetts is not more celebrated for her manufactures, commerce, and fisheries than for the moral qualities of the people engaged in these departments of industry. The intelligence, character, and happiness of the operatives are well known. This state abounds in beautiful cities, towns, and villages, and the traveller will observe every where within her borders a great number of churches and school houses.

Boston, the capital of the state, is a large and wealthy city, situated on a peninsula at the head of Massachusetts Bay, in 42° 21′ 27″ N. lat., and 71° 3′ 30″ W. lon. Distance 432 miles N. E. from Washington. It is the commercial and literary metropolis of New England. The city consists of three parts, namely, Old Boston, on the peninsula; South Boston, formerly a part of Dorchester; and East Boston, formerly Noddle's Island. It is connected with Roxbury by an isthmus, with Brookline by a causeway, and with Cambridge and Charlestown by several bridges. It is the focus of the railroad system of New England. As a commercial town Boston is second only to New York. The State House is situated on Beacon Hill, the highest eminence in the city. Directly in front of the State House is the celebrated "Boston Common." The most imposing building, on

---

leys of the Connecticut and Housatonic. Vicinity of Boston. Productions. Minerals. Morals. Remark on cities, towns, &c. Boston. Connection with neighboring places. Sections of the city. Rank. Public edifices, &c. Cam-

account of its associations, is Faneuil Hall, which is held in sacred veneration as the "Cradle of American Liberty." The population of Boston in 1850 was 136,871.

Cambridge, the seat of Harvard University, the oldest and most richly endowed institution of learning in the United States, is about 4 miles N. W. of Boston. The Observatory is in 42° 22′ 51.5″ N. lat., and 71° 7′ 22″ W. lon. *Charlestown* is on a peninsula N. of Boston, and connected with it by three bridges. It is noted for the monument which commemorates the battle of June 17, 1775. The United States Navy Yard and State Prison are located here. *Plymouth*, 36 miles S. E. of Boston, is memorable as the spot where the "Pilgrim Fathers" founded the first permanent settlement in New England, in 1620.

Lowell, on the Merrimack, is one of the largest manufacturing cities in America. Upwards of 10,000 females are employed in the factories, many of whom devote their leisure to literature and the fine arts. Immense quantities of broadcloths, carpets, and cotton cloths are here manufactured. Lowell is styled the "Manchester of America." Population, 33,833. There are also extensive manufactories at Lawrence, Waltham, Taunton, Canton, Ware, Springfield, Framingham, Fall River, Fitchburg, Pawtucket, and other places.

Salem, noted for its wealth and commerce, stands on a peninsula formed by two inlets of the sea. The East India trade is mostly carried on from this place. Newburyport is a handsome town near the mouth of the Merrimack. Ship building, manufactures, and the cod, mackerel, and whale fisheries are carried on here. Gloucester and Marblehead, near Salem, are considerable fishing towns. The cod fishery is extensive. New Bedford and Nantucket are extensively engaged in the whale fishery. Williamstown, Amherst, Andover, and Newton are seats of literary institutions. Worcester, Springfield, Groton, and Pittsfield are railroad centres.

---

bridge. Charlestown. Plymouth. Lowell. Other manufacturing towns. Salem. Newburyport. Gloucester. Marblehead. New Bedford. Nantucket.

§ 9. RHODE ISLAND.

Extent, from 41° 22′ to 42° 3′ N. lat., and from 71° 6′ to 71° 38′ W. lon. Area, 1340 square miles. Population, 147,545.

RHODE ISLAND is bounded on the N. and E. by Massachusetts; S. by the Atlantic; and W. by Connecticut. It is the least of the United States in extent of territory. It was founded at Providence in 1636, by Roger Williams. Though formerly an agricultural state, it now stands preëminent in manufactures. In the north-western part the surface is hilly, and the soil poor; in the southern portion it is generally level, and is an excellent grazing country. Along the shores of the Narragansett Bay the soil is very fertile. There are no mountains in Rhode Island. Mount Hope, in Bristol, the highest elevation in the state, and once the residence of the Indian king Philip, is only 300 feet in height. Narragansett Bay is a fine body of water, dividing the state into two parts. It is 30 miles in length and 15 miles broad, and embraces many beautiful islands. It is accessible at all seasons, and affords a spacious and secure harbor for vessels. The chief rivers are the Blackstone, Providence, Pawtux′et, Wood, and Pawcatuck′. The Island of Rhode Island, from which the state takes its name, is in Narragansett Bay. It is 15 miles long and averaging 3½ broad. Its climate and soil are excellent.

Providence, one of the capitals, is situated at the head of Narragansett Bay, 30 miles from the sea. It is a very flourishing city, and is rapidly increasing in wealth and population. It contains an area of about nine square miles, which is divided by Providence River into two parts, united by convenient bridges. The largest ships can come up to its wharves. Brown University, one of the best endowed literary institutions in the country, is situated on an eminence in the eastern section of the city. Lat. 41° 49′ 22″ N., and lon. 71° 24′ 48″ W. Distance 394 miles N. E. from Washington.

Newport, the other capital, and next in importance, is situated on the S. W. part of the Island of Rhode Island. The harbor is one of the finest in the world. The beauty of its situation and the salubrity of its climate have made this

---

College seats. Railroad centres. — RHODE ISLAND. Extent. Area. Population. Boundaries. When founded. Agriculture and manufactures. Soil. Mountains. Bay. Rivers. Island of Rhode Island. Providence. Newport.

town a place of fashionable resort for persons from the Southern and Middle States during the summer months.

Smithfield is a flourishing town near the northern boundary of the state. Warwick is a large manufacturing town. Bristol, on the eastern shore of Narragansett Bay, has considerable commerce. Pawtuck′et is a manufacturing village, four miles north of Providence, on the Blackstone River. It is noted as being the place where *the first cotton mill* was established in America, by Samuel Slater. This town is partly in Rhode Island and partly in Massachusetts.

§ 10 CONNECTICUT.

Extent, from 41° to 42° 2′ N. lat., and from 71° 20′ to 73° 15′ W. lon. Area, 4764 square miles. Population, 370,792.

CONNECTICUT is bounded on the N. by Massachusetts; E. by Rhode Island; S. by Long Island Sound; and W. by New York. It is the southernmost of the New England States. Numerous bays and inlets indent the southern shore, affording excellent harbors. The surface of the state, though not mountainous, is traversed with several considerable elevations; there are few level tracts. The great body of the state is excellent land, fitted for all purposes of agriculture; the best soil is in the valleys of the Connecticut and Housatŏn′ic Rivers. The other principal rivers are the Thames, Farmington, Naugatuck′, and Quin′nebaug, all of which are celebrated for their shad fisheries. The principal productions are corn, oats, rye, hay, and potatoes. Almost every farm has one or more orchards, and great quantities of cider are annually made.

The people of Connecticut have long been considered as a most energetic race. Her sons are scattered throughout the whole extent of the Union, carrying with them and disseminating their habits of industry and economy, and the cherished principles of their native land — "the land of steady habits." In every department of life they are found preëminent.

Connecticut produces some valuable minerals. Iron ore is found in Salisbury and Kent. "Verd antique" marble is found at Milford, and freestone (red sandstone) exists in abundance. Manufacturing industry prevails to a consider-

---

Smithfield. Warwick. Bristol. Pawtucket. — CONNECTICUT. Extent. Area. Population. Boundaries. Physical aspects. Productions. People. Minerals.

able extent. In point of commercial importance, Connecticut ranks third among the New England States. The principal exports are horses, mules, and dairy and farm produce. New York affords a market for the western portion of the state, and Providence for the eastern.

Hartford, one of the capitals and the oldest town, having been founded in 1635, is situated on the west bank of the Connecticut River, 50 miles from the Sound. The city is beautifully located, and has considerable commerce, notwithstanding its inland situation. The first Deaf and Dumb Asylum in the United States was established here. There is also an Insane Asylum. Trinity (formerly Washington) College is located at Hartford. The "Old Charter Oak," so celebrated in history, is still standing, (1855,) and affords an object of interest to visitors. The trunk of this venerable relic now measures 21 feet in circumference. Lat. of the city 41° 45′ 59″ N., and lon. 72° 40′ 45″ W. Distance 335 miles N. E. from Washington. Population, 13,555.

New Haven, the other capital, is situated near the seacoast, at the head of a small bay. It is a place of considerable commercial and manufacturing importance, and one of the most beautiful cities of the Union. It is laid out in two parts: the old town and the new. In those portions appropriated exclusively to residences, almost every house has a garden in front, with flowers, vines, and trees. New Haven is the seat of Yale College, one of the oldest and most flourishing institutions in the whole country. Besides the buildings belonging to the college, there are many other beautiful public edifices. Lat. 41° 18′ 27.7″ N., lon. 72° 55′ 24″ W. Distance 301 miles N. E. from Washington. Population, 20,345.

Norwich, at the head of navigation on the Thames, is the third city in point of population. The falls in the river afford fine mill seats, where there are some very extensive manufactories. New London, 14 miles below Norwich, near the mouth of the Thames, has an excellent harbor. It is actively engaged in the whale and seal fisheries. Middletown is a pleasant place on the Connecticut, 15 miles below Hartford. Its coasting trade and manufactures are important. Stonington, Saybrook, and Bridgeport are among the noted seaports along the coast.

Industrial pursuits. Hartford. The "Charter Oak." New Haven. Norwich.

Exercises in Voyages and Travels.

Coastwise from Thomaston to Newburyport. From Thomaston to Eastport. Railroad from Bath to Boston. From Boston to Portsmouth. From Montpelier to Boston. From Boston to Burlington. From Boston to Springfield and New York. From Bridgeport to Albany. From Boston to Albany. From Boston to New York, via Stonington; via Fall River; and via Norwich. A ship freighted with lumber from Bangor to Hartford. Import into Boston a cargo of teas; of spices; of coffee from the Old World and the New. Import into Providence a cargo of silk goods; of ivory; of cutlery.

§ 11. The Middle States.

The Middle States are so called from their geographical position. They are New York, New Jersey, Pennsylvania, Delaware, and Maryland. This section is bounded on the N. by the Great Lakes, River St. Lawrence, and the provinces of Canada; E. by the New England States and the Atlantic; S. by the Potō′mac River, which separates Maryland from Virginia; and W. by portions of Virginia and Ohio. It lies between 38° and 45° N. lat., and 72° and 81° W. lon. The advantageous situation, the diversity of surface, the natural facilities for intercourse, and the energy of the people, have unitedly elevated the Middle States to a high distinction among their sister republics. The staple productions of the soil are wheat, Indian corn, and tobacco; the mines yield an inexhaustible supply of coal, iron, and other useful minerals. On the north and west the great lakes and the St. Lawrence form an outlet for commerce; and the rivers flowing in a southerly direction convey to the Atlantic coast the products of the interior.

The uninterrupted facilities which these states enjoy in their relation with all their sister states, and with foreign countries, will secure for them a continued and an increasing prosperity.

New London. Middletown. Other towns. — The Middle States. Boundaries. Causes of distinction. Productions. Commercial advantages. Prospects. —

§ 12. New York.

Extent, from 40° 30′ to 45° N. lat., and from 71° 56′ to 79° 56′ W. lon. Area, about 46,000 square miles. Population, 3,097,394.

New York is bounded on the N. by Lake Ontario, the St. Lawrence River, and Canada East; E. by Vermont, Massachusetts, and Connecticut; S. by the Atlantic Ocean, New Jersey, and Pennsylvania; and W. by Pennsylvania, Lake Erie, and Niăg′ara River. The first settlement was made by the Dutch, in 1615, on Manhăt′tan Island, now New York city, and at Albany.

Two chains of the Alleghā′nies pass through the eastern part of the state. The Highlands, coming from New Jersey, cross the Hudson near West Point, and soon after pass into Connecticut. The Căts′kill Mountains, farther west, and more irregular in their outline, cross the Mō′hawk, and continue, under different names, along the western border of Lake Champlain. The western part of the state has generally a level surface, except in the southern tier of counties, where the western ranges of the Alleghā′nies terminate. The surface of the state in general may be regarded as an elevated tract, with numerous indentations and depressions, which form the basins of the lakes and the valleys of fertilizing streams.

The principal rivers of New York are the St. Lawrence, Niăg′ara, Hudson, Delaware, Susquehan′na, Genesee′, Oswē′go, Oswegătch′ie, Black, St. Rē′gis, Mō′hawk, Saranăc′, Salmon, Chenăn′go, Tiō′ga, Sĕn′eca, Alleghā′ny, Crō′ton, Häer′lem, and East. The chief inland lakes are George, Cayū′ga, Sĕn′eca, Oneī′da, Oswegătch′ie, Canandāi′gua, Chatâu′que, Skeneăt′eles, and Crooked. New York is noted for a number of most magnificent waterfalls. The "Falls of Niăg′ara" form the most stupendous cataract in the world. The river falls perpendicularly about 160 feet over the precipice. The chief islands in tide water are Long, Stăt′en, Manhăt′tan, Blackwell's, Gardner's, Shelter, and Plum.

New York ranks first among the states in population, wealth, political importance, and public improvements. The system of canals and railroads is on an extensive scale, and of greater value than those of any other state. The Erie

---

New York. Extent. Area. Population. Boundaries. First settlement. Mountains. Western part of the state. General aspect. Rivers. Lakes. Waterfalls. Islands. Rank among the states. Railroads. Canals. Produc-

Canal is one of the most magnificent works of the kind ever constructed; it is 364 miles long, extending from Buffalo to Albany.

The agricultural productions are abundant and excellent. In the western section they are chiefly those of tillage, of which wheat is the staple; the east is best adapted to grazing. The manufactures of New York are extensive. Every section of the state abounds in excellent water power, which is generally improved for manufactories, flour mills, saw mills, &c. Cottons, woollens, iron, paper, leather, glass, oil, silk, cutlery, hardware, firearms, and carriages are the more important articles. As a commercial state it surpasses all others in the Union. The banks of New York form one of its distinguishing features, as they exercise a powerful influence on the financial condition of all the other states.

Albany, the capital of the state, is situated on the west bank of the Hudson, 145 miles from its mouth. It is the terminating point of the Erie and Champlain Canals, and of several railroads. It has a large commerce, and its manufactures are considerable. Lat. 42° 39′ 3″ N.; lon. 73° 44′ 49″ W. Distance 376 miles N. N. W. of Washington, and 164 W. of Boston. Population, 50,763.

The city of NEW YORK is in the south-east part of the state, on Manhattan Island, at the confluence of the Hudson and East Rivers. It occupies the whole island, and is 13½ miles long, with an average breadth of 1¾ miles. The densely inhabited portion of the city is at the southern extremity of the island, where the principal business is carried on. In population, wealth, and commerce New York is the greatest city on the American continent. It is second only to London in the amount of its shipping. A very large portion of the imports and exports of the United States pass through it. The harbor of New York is one of the safest and most beautiful in the world, affording free ingress and egress to vessels of the largest class at all seasons of the year.

New York is a world within itself. Within the circuit of this "Empire City of the New World" are mingled people of every nation, kindred, and tongue, exercising every art and profession known to man; churches of every persuasion; people of all creeds; institutions of every imaginary shade; and man in all his phases and in every condition. Lat. 40° 42′ 43″ N.; lon. 74° 0′ 3″ W. Distance 226 miles

---

tions. Manufactures. Commerce. Banks. Albany. New York city. Rank.

N. E. of Washington, 216 miles S. W. of Boston, and 86 miles N. E. of Philadelphia. Population, 515,507.

Brooklyn, the seat of justice of King's county, and second city in population in the state, is situated on the west end of Long Island, on the easterly side of East River, opposite New York city. From the top of the "Heights" the city spreads over a gentle or undulating slope, for several miles, towards Gowanus Bay on the south, and Williamsburg on the north-east. Williamsburg is now a part of Brooklyn city. The ample limits of this city, and fine situation close to the business part of the great commercial emporium, with which it is connected by six steam ferries, render it a favorite residence for merchants and others who do business in New York. To these causes it is indebted for its rapid growth in population and wealth; and it is destined to attain inconceivable greatness. The harbor is deep and spacious. Along the south-west front of the city is the Atlantic Dock, a deep and capacious basin of 42 acres, which is surrounded by piers and bulkheads, containing a large number of substantial warehouses. On Wâll'about Bay, at the north side of the city, is the United States Navy Yard. Here, too, is the United States Dry Dock. Population, about 175,000.

Troy is on the east bank of the Hudson, 6 miles above Albany. It is a thriving city, and a rival to Albany in business and enterprise. Manufactures of various descriptions occupy a large portion of the people. Population, 28,785.

Rochester is situated on the Genesee River, 7 miles from Lake Ontario, and 220 miles N. W. of Albany. To its vast water power and the Erie Canal Rochester owes its prosperity and surpassing growth. In 30 years it has risen from a marshy wilderness to a population of 36,403, active with industry.

Buffalo is situated at the east end of Lake Erie, and is the western terminus of the Erie Canal. A great chain of railroads binds Buffalo to New York, Boston, Albany, and the richest portion of the Empire State along the course of the Erie Canal; and another, traversing the valley of the Susquehanna and Delaware, links it with New Jersey, New York city, and Philadelphia. The Lake Shore Railroad connects it with the vast network of railroads in the Western States. A large amount of capital is invested in manufactures. Population, 42,261.

Among other places on the Hudson, there is Poughkeep'sie,

Harbor. A world within itself. Brooklyn. Troy. Rochester. Buffalo.

noted for its agricultural wealth; Newburg, celebrated as a depôt of butter and cheese; West Point, the seat of the United States Military Academy; Hudson, an old trading town; and Sing Sing, the location of a state prison. Along the Erie Canal there is Schenĕc′tady, the seat of Union College; U′tica, a beautiful and thriving town near the centre of the state; Sÿr′acuse and Salī′na, famous for their salt works; and Lockport, where the canal descends by five double locks. Among other noted towns are Auburn, the location of a celebrated state prison; Geneva, the seat of a college; Canandāi′gua, remarkable for its wealth and beauty; Saratō′ga and Bâll′ston, noted for their mineral springs.

§ 13. New Jersey.

Extent, from 38° 57′ to 41° 22′ N. lat., and from 73° 58′ to 75° 29′ W. lon. Area, 8320 square miles. Population, 489,330.

New Jersey is bounded on the N. by New York; E. by the Hudson River and the Atlantic; S. by the Atlantic; and W. by Delaware Bay and River, which separate it from Delaware and Pennsylvania. This state was first colonized at Elizabethtown, in 1664. The northern part of the state is mountainous. An elevated range, called the "Palisades," commences near Hoboken, and extends along the Hudson for miles, forming a perpendicular wall of stone, which at some points is 500 feet high. The middle is diversified by hills and valleys, and is well adapted to grazing and grain. The southern part is level and sandy, and chiefly barren. The chief rivers are the Hudson, Delaware, Raritan, Passā′ic, and Hack′ensack. The bays are Delaware, Newark, New York, Raritan, Sandy Hook, Bar′negat, Little and Great Egg Harbors.

New Jersey enjoys peculiar advantages from its geographical position, which requires all the great lines of communication between the north-east and south to extend through its territory. Farming is the chief occupation of the inhabitants. Garden vegetables and fine fruits in abundance are raised for the New York and Philadelphia markets.

Trenton, the capital of the state, is situated on the east bank of the Delaware River, at the head of sloop navigation.

Towns on the Hudson. Towns along the Erie Canal. Other noted towns. — New Jersey. Extent. Boundaries. First settlement. Physical aspects. Rivers. Bays. Advantages of situation. Chief occupation. Trenton. New-

It is 30 miles N. E. of Philadelphia, and 60 miles S. W. of New York. Above the city, the river descends by rapids, or falls; and at the foot of this descent it is spanned by a fine bridge, 1100 feet long, with five arches, supported by stone piers. The city is connected to New York and Philadelphia by railroads. Lat. 40° 14′ N., lon. 74° 46′ 30″ W. Distance 166 miles from Washington.

Newark, on the Passā′ic, 49 miles N. E. of Trenton, and 9 miles west of New York, is the most populous city of the state. In proportion to its population, few cities are more extensively engaged in manufactures. Newark cider has great celebrity. Population, 38,893. Princeton, 11 miles N. E. of Trenton, is the seat of the College of New Jersey. Jersey City, on the Hudson, opposite New York, is the commencing point of southern travel from that city, with which it is connected by two ferries.

§ 14. PENNSYLVANIA.

Extent, from 39° 43′ to 42° 17′ N. lat., and from 74° 44′ to 80° 34′ W. lon. Area, 46,000 square miles. Population, 2,311,786.

PENNSYLVANIA is bounded on the N. by New York and Lake Erie; E. by Delaware River, which separates it from New York and New Jersey; S. by Delaware, Maryland, and Virginia; and W. by Virginia and Ohio. This state was first settled in 1681, by a colony of English Quakers, under the guidance of William Penn, from whom it derives its name. It is traversed from S. W. to N. E. by the Alleghā′nies in several ridges. On both sides of the mountains the country is either moderately hilly or level; and the soil is generally excellent, and adapted to wheat, the staple production in agriculture.

Pennsylvania ranks among the largest and wealthiest states in the Union, and is styled the "Keystone State." It is the great mining district of the United States, producing coal and iron. West of the mountains are vast fields of bituminous coal. The anthracite coal region lies between the Blue Ridge and the north branch of the Susque′hanna, occupying the whole mountain districts to the south and east. The iron is used in all the machinery and cutlery made in the state, and is extensively used for railroads. The chief

---

ark. Princeton. Jersey City. — PENNSYLVANIA. Extent. Boundaries. First settlement. Physical aspects. Rank. Coal. Iron. Rivers. Harrisburg rivers are the Delaware, Sçhŭyl'kill, Lē'high, Susquehăn'na, Juniă'ta, Genesee', Alleghā'ny, Monongahē'la, Ohio, Clarion, and Youghioghē'ny.

Harrisburg, the capital of the state and of Dauphin county, is situated on the Susquehanna, 106 miles N. W. of Philadelphia, and 110 miles from Washington. Its situation is commanding, having a fine view of the river and surrounding country. The fine bridge over the Susquehanna is 2876 feet long, and 50 feet above the river. A short distance below it is the viaduct of the Cumberland Valley Railroad, an elegant and substantial structure.

Philadelphia, the first city of Pennsylvania in population, wealth, and manufactures, and the second in the United States, is situated on a peninsula formed by the confluence of the Delaware and Sçhŭyl'kill Rivers. The city was laid out with beautiful regularity in 1683, by its illustrious founder, William Penn. The commerce and business of the city is on the Delaware side, while the Schuyl'kill affords pleasing landscapes and agreeable places of residence. No feature of Philadelphia is more striking than the regularity and neatness of its streets, its fine squares ornamented with shade trees and shrubbery, and its public edifices of great cost and elegance. The old State House, or Independence Hall, is an object of great interest, where the "Declaration of American Independence" was decreed and signed by the Continental Congress, on the 4th of July, 1776. Lat. 39° 56′ 59″ N., and lon. 75° 9′ 54″ W. Distance from Washington, 136 miles N. E. Population, 408,762.

Pittsburg, the "Birmingham of America," is situated on the head waters of the Ohio, at the confluence of the Alleghā'ny and Monongahē'la Rivers, 297 miles west of Philadelphia. It is the second city in the state, and is especially distinguished for the bituminous coal beds in its vicinity, which supply fuel for the numerous manufacturing establishments. From its position, Pittsburg is a great commercial as well as manufacturing emporium. It holds to Pennsylvania the same relation as Buffalo does to New York, being the gate of commerce between the east and west. Alleghā'ny City on the north, and Birmingham on the south, are suburbs of Pittsburg, with which it is connected by bridges and ferries.

Lancaster is a beautiful town, situated in a pleasant and

Philadelphia. The Delaware and Schuylkill sides of the city. Appearance of the city. Public buildings. Pittsburg. Suburbs of Pittsburg. Lancaster.

highly cultivated region, and is a thoroughfare between Philadelphia and the west. *Rĕading* is an agreeable place, and has considerable trade and manufactures. Pottsville is a flourishing town, which owes its importance to the coal mines in its vicinity. Carlĭsle, York, Chambersburg, Germantown, Easton, Bristol, Bethlehem, and Erie are other important towns.

§ 15. Delaware.

Extent, from 38° 27′ to 39° 50′ N. lat., and from 74° 50′ to 75° 40′ W. lon. Area, 2120 square miles. Population, 91,532.

Delaware is bounded on the N. by Pennsylvania; E. by Delaware River and Bay; and S. and W. by Maryland. This is the smallest state in the Union in respect to population, and, next to Rhode Island, in territory also. It was originally settled by a colony of Swedes as early as 1643. The general aspect of this state is that of an extended plain, or several inclined planes, favorable for cultivation. Some of the upper portions of Newcastle county are irregular and broken. On the table land forming the dividing ridge between the Delaware and Chesapeake is a chain of swamps, which give rise to various streams that descend to either bay. Its manufactures, consisting chiefly of woollen and cotton goods, leather, paper, iron, gunpowder, &c., are its main dependence. Its flouring mills are numerous and extensive, and its flour takes a high stand in the market.

Dover, the capital, is situated on Jones's Creek, about the middle of the state. Lat. 39° 10′ N., lon. 75° 30′ W. Distance from Washington 114 miles. *Wilmington* is the chief seaport and largest town, situated between Brandywine and Christiana Creeks, just above their junction. The finest collection of flour mills in the Union are in its vicinity. Its distance from Philadelphia is 28 miles S. W., and from Baltimore 70 miles N. E., with which cities it is connected by railroad. Population, 13,979. *Newcastle*, on the Delaware, a few miles south of Wilmington, has considerable trade with Philadelphia.

Reading. Pottsville. Other towns. — Delaware. Extent. Boundaries. Rank. General features. Manufactures, &c. Dover. Wilmington. New-

§ 16. MARYLAND.

Extent, from 38° to 39° 43′ N. lat., and from 75° 10′ to 79° 20′ W. lon.
Area, 13,959 square miles. Population, 583,034.

MARYLAND is bounded on the N. by Pennsylvania; E. by Delaware and the Atlantic; S. and W. by Virginia, from which it is for the most part separated by the Potō′mac River. It is the most southerly of the Middle States, and very irregular in its outline. The first permanent settlement within the limits of Maryland was made on the Island of Kent, in the Chesapeake Bay, by William Claiborne, in 1632; though it was regularly colonized in 1634, by Lord Baltimore, with 100 emigrants, mostly Catholics. Maryland is divided by Chesapeake Bay into two parts, called the Eastern and Western Shores. The land on the Eastern Shore is low and level. That on the Western Shore, below the falls of the rivers, is principally level, but above it gradually becomes uneven and hilly, and in the western part of the state it is mountainous, being intersected by the Alleghā′nies. The chief rivers are the Potō′mac, Susquehăn′na, Patăps′co, Patŭx′ent, Elk, Sassafras, Chester, St. Mary's, and the Sĕv′ern. There is much good soil existing in every section of the state, but the most productive in grain and fruits are some of the limestone tracts in the western counties. Iron and coal of superior quality are among the mineral resources. The flour of Maryland is considered equal to the best in the market.

Annapolis, the capital of Maryland, is situated on the Sev′ern River, three miles from its entrance into Chesapeake Bay, and 20 miles S. E. of Baltimore. The United States Naval School is located here.

Bâl′timore, the chief city of the state, stands on a bay which sets up from the Patăps′co River, 14 miles from the Chesapeake Bay. It has an extensive commerce, and is one of the greatest flour markets in the world. Many of the public edifices are splendid and costly. Bâl′timore has been named the "Monumental City," chiefly from the two great monuments it contains: the Washington Monument, 180 feet in height, and the Battle Monument, 52 feet high, erected in memory of the patriots who fell in defence of the

---

castle.—MARYLAND. Extent. Boundaries. Place. Shape. First settlement. Date of its colonization. Chesapeake Bay. Eastern Shore. Western Shore. Rivers. Soil. Productions. Minerals. Flour. Annapolis.

city against the British, in 1814. Lat. 39° 17′ 47.8″ N., and lon. 76° 36′ 39″ W. Distance from Washington 38 miles. Population, 169,054. Frederick City, Hāgerstown, Williamsport, Blā′densburg, and Cumberland are important as entrepots of commerce.

Exercises in Voyages and Travels.

By steamboat from Troy to New York. By railroad from New York to Dunkirk. From Albany to Buffalo. From Albany to Whitehall. From Brooklyn to Greenport. From New York to Philadelphia, via Amboy. From Philadelphia to Chambersburg. From Philadelphia to Pottsville. From Harrisburg to Pittsburg. By canal from Albany to Buffalo. Transportation of merchandise from Philadelphia to Pittsburg. Transportation of omnibuses built in Newark, N. J., to Boston. A cargo of coal from Philadelphia, to Lowell, Mass. Transportation of manufactured cottons from Lowell to Philadelphia. Import into New York, a cargo of logwood and sarsaparilla.

§ 17. The Southern States.

In this section are included the States of Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas. They lie between the Potomac River and the Rî′o Grän′de dĕl Nör′te, and are bounded N. by Pennsylvania, N. E. and E. by Maryland and the Atlantic, S. by the Gulf of Mexico. They are all border states, open to the sea. The coast is indented with numerous bays and inlets, and lined with many islands and reefs, which render navigation difficult and dangerous. Excepting in Louisiana and Texas, there are very few channels sufficiently capacious and deep for large shipping; hence foreign commerce is comparatively limited. The coasting trade, however, is very extensive. The people are chiefly devoted to agricultural pursuits. The great staples are wheat, corn, tobacco, cotton, rice, and sugar. From the pine forests in the Carolinas and Georgia, large quantities of pitch, tar, turpentine, and lumber are obtained. The live oak timber of Florida is unequalled in quality, and is in great demand for ship building.

Baltimore. Other places.—The Southern States. Boundaries. Bays. Islands. Foreign commerce. Coasting trade. Occupation. Productions. Pine

§ 18. VIRGINIA.

Extent, from 36° 33′ to 40° 43′ N. lat., and from 75° 25′ to 83° 40′ W. lon. Area, 61,352 square miles. Population, 1,421,661.

VIRGINIA is bounded on the N. by Pennsylvania and Maryland; E. by the Atlantic; S. by North Carolina and Tennessee; and W. by Kentucky and Ohio. This state is often called the " Old Dominion," from its being the oldest English settlement in America. It was founded at Jamestown, in 1607. The face of the country, though exhibiting but little grandeur, is greatly diversified, and in some parts is rich and pleasing in the continued outline of hill, valley, river, and plain. The soil, too, is as varied as the surface, presenting every grade of fertility and sterility. From the sea coast to the head of tide water on the rivers, embracing a tract over 100 miles in width, the country is low, sandy, covered with pitch pine, and is unhealthy in the warm season. Between the head of tide water and the Blue Ridge the soil is better, and the surface becomes uneven and hilly. The interior of the state, traversed by successive ridges of the Alleghā′nies, running from S. W. to N. E., is a healthy region, and in the valleys are some of the finest lands in the state. The country west of the mountains, towards the Ohio River, is rough and wild, with occasional fertile tracts, but rich as a mineral region.

The chief rivers are the Potō′mac, James, Shenandō′ah, Rappahăn′nock, York, Appomăt′tox, Ohio, Great and Little Kanâw′ha, Sandy, and Monongahē′la. Drummond Lake, in Dismal Swamp, serves as a feeder to the canal. The staple productions of agriculture are tobacco, wheat, and corn. The mines of coal, iron, gold, and salt are exceedingly valuable, and among the mountains there are celebrated mineral springs. Virginia has given birth to many eminent patriots, statesmen, and warriors, among whom were Washington, Jefferson, Madison, Monroe, and Chief Justice Marshall.

Richmond, the capital of the state, is beautifully situated on the James River, 150 miles from its mouth, and immediately below the falls. It is a great commercial depot, having an extensive back country, abounding in tobacco, wheat, hemp, and coal. Lat. 37° 32′ 17″ N., lon. 77° 27′ 28″ W

---

forests. Live oak timber. — VIRGINIA. Extent. Boundaries. First settlement. Surface. Soil. Lowlands. Terrace. Highlands. West of the mountains. Rivers, &c. Productions. Mines. Springs. Eminent men. Richmond. Norfolk. Petersburg and Fredericksburg. Wheeling. Yorktown.

Distance from Washington 122 miles, south. Population, 27,482.

Norfolk is the principal seaport. It is situated in the S. E. part of the state, on the Elizabeth River, a few miles from its entrance into Hampton Roads, and 217 miles S. S. W. of Washington. It has a safe and commodious harbor. At Gosport, near Portsmouth, on the west side of Elizabeth River, is a navy yard, with a dry dock built of hewn granite. Population, 14,326.

Petersburg, on the Appomăt′tox, and Fredericksburg, on the Rappahăn′nock, are important places of trade. Wheeling, on the Ohio, is a large manufacturing town. Yorktown, on York River, is memorable for the surrender of Lord Cornwallis and the British army in 1781. MOUNT VERNON, on the western shore of the Potomac, 15 miles from Washington, is venerated as the former residence and last resting-place of the IMMORTAL WASHINGTON.

§ 19. NORTH CAROLINA.

Extent, from 33° 53′ to 36° 33′ N. lat., and from 75° 45′ to 84° W. lon. Area, 43,800 square miles. Population, 868,903.

NORTH CAROLINA is bounded on the N. by Virginia; E. by the Atlantic; S. by South Carolina; and W. by Tennessee. This state was first settled at Albemarle, by emigrants from Virginia, between 1640 and 1650. Along the whole coast is a narrow ridge of sand, separated from the main land in some places by narrow sounds, in others by broad bays. The passages and inlets through it are shallow and dangerous. O′cracoke Inlet is the only one north of Cape Fear through which vessels can pass. In the maritime counties the land is low, and covered with extensive marshes and swamps, and for 60 miles inland is a dead level, generally sandy, and covered with forests of pitch pine. Above the falls of the rivers the country becomes uneven, and the soil more fertile. In the western part of the state is an elevated plateau, and some high ranges of the Alleghā′nies. Black Mountain, the highest summit in the United States east of the Rocky Mountains, is 6476 feet high.

The chief rivers are the Chowăn′, Roanoke′, Tar, Neūse,

Mount Vernon. — NORTH CAROLINA. Extent, &c. Boundaries. Settlement. Peculiarity of the sea coast. Ocracoke Inlet. Maritime counties. Above the falls. Western parts. Black Mountain. Rivers. Sounds and bays. Capes.

Cape Fear, Catâw′ba, Broad, Yăd′kin, and Pamlico. The principal sounds and bays are Păm′lico and Albemärle′, Onslow and Râ′leigh. Capes Lookout and Fear are much dreaded by mariners; and Cape Hat′teras is the most dangerous headland on the American coast. The gold region of North Carolina lies on both sides of the Blue Ridge, in the S. W. part of the state. In the swamps rice of a fine quality grows in abundance. Cotton, tobacco, and rice are the staple productions. The pine forests of North Carolina yield nearly the whole quantity of turpentine, tar, and rosin in the United States. The upper country produces wheat and other grains, with hemp and flax.

Raleigh, the capital, is situated in the centre of the state, near the River Neuse. Lat. 35° 47′ N., lon. 78° 48′ W. Distance 286 miles from Washington. *Wilmington*, the largest town and chief seaport, is situated on Cape Fear River, 35 miles from the sea. Fayetteville, near the west branch of Cape Fear River, is second in population, and is better situated and provided with facilities for trade, than any other town in the state.

§ 20. SOUTH CAROLINA.

Extent, from 32° 2′ to 35° 10′ N. lat., and from 78° 24′ to 83° 30′ W. lon. Area, 28,200 square miles. Population, 668,507.

SOUTH CAROLINA is bounded on the N. and N. E. by North Carolina; S. E. by the Atlantic; and S. W. by the Savannah River, which separates it from Georgia. This state was first settled, at Old Charleston, in 1670. The present city of Charleston was begun ten years later. South Carolina is triangular in its outline. The sea coast is bordered with a chain of fertile islands. The low country, extending from 80 to 100 miles inland, is covered with forests of pine barrens, interspersed with marshes and swamps, which form excellent plantations. Beyond this is the middle country, extending 50 to 60 miles in breadth. It is composed of numerous ridges of sand hills, presenting an undulating appearance. Further inland the mountains become abrupt, but on advancing the country displays an elevated plateau, called the Upper Country, succeeded by a fine district of hills and dales. The Blue Ridge passes along the N. W. border of the state.

Gold region. Rice. Other productions. Upper country. Raleigh. Wilmington. Fayetteville. — SOUTH CAROLINA. Extent, &c. Settlement. Shape. Coast. Low country. Middle country. Upper country. Mountains. Rivers.

The chief rivers are the Savannah, Pedee′, Black, Santee′, Cooper, Ashley, Stō′no, and Edisto. On the coast are Bull's and Wingâw′ Bays, Port Royal and Georgetown entrances, and Tyree and St. Helena Sounds. Cotton and rice are the staple productions of South Carolina, but the soil and climate are well adapted to tobacco and indigo. The climate of the upper country is healthy at all seasons; but in the low country it is sickly during the summer months.

Columbia, the capital of the state, is a pleasant village, situated on the Congaree River, below the confluence of the Broad and Salŭ′da Rivers, and 120 miles N. W. of Charleston. Here is located the College of South Carolina, a flourishing institution, which is liberally supported by the state. Lat. 33° 57′ N., lon. 81° 7′ W. Distance from Washington 500 miles.

Charleston, the principal commercial city of South Carolina, occupies a point of land formed by the confluence of Ashley and Cooper Rivers, which together enter the ocean by a spacious and deep harbor, extending seven miles below the city. Charleston may be considered as the metropolis of the Southern Atlantic States. Into it flow many of the productions of North Carolina and Georgia. Its foreign commerce is extensive and valuable, as is also its coasting trade. Lat. 32° 46′ 33″ N., lon. 79° 55′ 38″ W. Distance from Washington 544 miles. Population, 42,985. Hamburg, on the Savannah, opposite Augusta, is connected with Charleston by railroad.

§ 21. GEORGIA.

Extent, from 30° 19′ to 35° N. lat., and from 80° 50′ to 85° 40′ W. lon. Area, 61,500 square miles. Population, 905,999.

GEORGIA is bounded on the N. by Tennessee and North Carolina; N. E. by South Carolina; S. E. by the Atlantic; S. by Florida; and W. by Alabama. This is the most southerly of the "original thirteen states," and was first settled in 1733, at Savannah, by a colony from England, under General James O′glethorpe. The topography of Georgia, both as it regards the arrangement of its coast and the whole inland country, is very similar to that of South Carolina; and the staple productions are the same, with the addition of some tropical fruits, as figs, oranges, lemons, &c. Oak and pine

---

Bays, &c. Productions. Climate. Columbia. Charleston. Hamburg. — GEORGIA. Extent, &c. Boundaries. Place and settlement. Topography.

timber abound in the forests. The Sea Islands, so celebrated for the beautiful texture of their cotton, are Tybēē′, Os′sabaw, St. Catharine's, Sapĕl′lo, St. Simon's, and Cumberland. The principal rivers are Savannah, Ogēē′chee, Altamahâ′, Satil′la, Ocmŭl′gee, Ocō′nee, St. Mary's, Flint, Chattahôô′chee, Tallapôô′sa, and Côô′sa.

Milledgeville, the capital of the State of Georgia, is situated at the head of steamboat navigation on Ocō′nee River, 300 miles from the sea. It stands on elevated ground, in the midst of a rich and populous cotton-growing region. Lat. 33° 7′ 20″ N., lon. 83° 19′ 45″ W. Distance from Washington 642 miles.

Savannah is the largest and most important city of Georgia. It is situated on the south bank of the Savannah River, 17 miles from the sea. It has an excellent harbor, with a safe and easy entrance from the ocean. Late improvements in railroads and other channels of communication have added largely to its growth and prosperity. Lat. 32° 4′ 53″ N., lon. 81° 5′ 14″ W. Distance from Washington 662 miles. Population, 16,060.

Augusta, on the Savannah River, below the falls, and 125 miles above Savannah city, is an entrepot for the produce of a large district, being connected by railroads with important points in the adjacent states. Macon, Columbus, Darien, and Athens are noted towns.

§ 22. FLORIDA.

Extent, from 25° to 31° N. lat., and from 80° to 87° 30′ W. lon.
Area, 53,786 square miles. Population, 87,401.

FLORIDA is bounded on the N. by Georgia and Alabama; E. by the Atlantic; S. and W. by the Gulf of Mexico; and W. by Alabama. This is the most south-easterly state of the Union; the greater part of it is a peninsula, extending south between the waters of the Atlantic and Gulf of Mexico. The United States government purchased this territory of Spain in 1819; and in 1845 it was made one of the states of the Union. Florida is noted for its luxuriant vegetation, and the brilliant colors of its flowering shrubs. The coast, indented with bays and lagoons, extends nearly 1200

Productions. The Sea Islands. Rivers. Milledgeville. Savannah. Augusta. Other towns. — FLORIDA. Extent, &c. Boundaries. Relative situation, &c. For what noted? Bays. Lagoons. Surface. Southern portion. Northern.

miles. The surface is generally level, and but little elevated above the ocean. The southern portion of the state presents singular alternations of savannas, hummocks, lakes, and grass ponds, called collectively "everglades," which extend from Cape Sable into the heart of the country for several hundred miles. Okeechō′bee Lake is included in this tract. The northern part of the state has a diversity of surface. The soil is generally sandy except in the hummocks. These hummocks consist of a reddish yellow or black clay mixed with sand, and vary in extent, from a few acres to several miles, and constitute no small part of the peninsula. Another portion consists of "pine barrens," where the soil is poor. The soil in many parts is well adapted to the growth of cotton, sugar, tobacco, rice, and tropical fruits. The forests produce an abundance of live oak timber, cedar, and yellow pine. Turtle and other fisheries are carried on extensively among the Keys. Granite is quarried to some extent.

Tallahas′see, the capital, is situated in the midst of a fertile and undulating region, upon elevated ground, in the northern part of the state. Lat. 30° 28′ N., lon. 84° 36′ W. Distance from Washington, 896 miles. Twenty miles south of Tallahas′see is St. Mark's, on the Gulf of Mexico, where ships discharge their cargoes bound for the capital, to which they are conveyed by railroad.

Pensacola, the most westerly town in Florida, is situated on a bay of the same name, about 10 miles from the Gulf of Mexico. It is the principal port of entry and city in the state. One of the United States navy yards is located here. Lat. 30° 24′ N., lon. 87° 10′ 12″ W. Distance from Washington 1050 miles.

Key West, one of the islets at the southern extremity of the peninsula, has a fine harbor, and is the seat of the Wrecker's Court, to whose decision all cases of salvage are submitted. It contains a military station of the United States.

St. Augustîne′, the oldest town in the United States, having been settled in 1564, is situated two miles from the Atlantic, on the south side of a peninsula, and is protected from the ocean by Anastasia Island. It enjoys a pure and healthful climate.

Hummocks. Soil. Productions. Fisheries, &c. Tallahassee. Pensacola. Key West. St. Augustine. — ALABAMA. Extent, &c. Boundaries. Face of

§ 23. Alabama.

Extent, from 30° 17′ to 35° N. lat., and from 84° 58′ to 88° 26′ W. lon.
Area, 50,781 square miles. Population, 771,671.

Alabama is bounded on the N. by Tennessee; E. by Georgia; S. by Florida and the Gulf of Mexico; and W. by Mississippi State. It was admitted into the Union in 1820. The northern parts of the state are mountainous, being crossed by the S. W. extremity of the Alleghā′nies. In the south the country is generally level. The two divisions differ essentially in soil, climate, and natural productions. The north has a fine fertile soil, and the hills and mountains are covered with immense forests of oak, hickory, ash, elm, cedar, and poplar. The central region is comparatively sterile, and covered with pine. Forests of cypress, gum, swamp oak, holly, and live oak diversify the south, and the soil is rich, deep, and well adapted to the growth of cotton, sugar, rice, tobacco, and tropical fruits. Alabama has an extensive foreign commerce.

Mobîle, the principal city and only port of entry in Alabama, is situated 30 miles north of the Gulf of Mexico, on Mobile Bay. It has a good harbor, though difficult of access, being obstructed by marshy islands and shoals. Vast quantities of cotton are annually exported. Lat. 30° 41′ 26″ N., lon. 88° 1′ 29″ W. Distance from Washington 1033 miles. Population, 20,514.

Montgomery, the capital, is on the Alabama River, at the head of steamboat navigation. It is the centre of an extensive trade in cotton. Distance from Mobile 220 miles N. E. Tuscalôô′sa, formerly the capital, is on the Black Warrior River. The University of Alabama is located here.

§ 24. Mississippi.

Extent, from 30° 10′ to 35° N. lat., and from 88° 10′ to 91° 35′ W. lon.
Area, 47,114 square miles. Population, 606,555.

Mississippi is bounded on the N. by Tennessee; E. by Alabama; S. by the Gulf of Mexico and Louisiana; and W. by the Pearl and Mississippi Rivers, which separate

---

the country. Productions of the three sections. Mobile. Montgomery. Tuscaloosa.—Mississippi. Extent, &c. Boundaries, &c. Surface. Staple it from Louisiana and Arkansas. The first settlement in this state was made at Natchez, in 1716, by the French. It was admitted as a state of the Union in 1817. The surface in the southern section, for about 100 miles from the Gulf, is nearly a dead level, covered chiefly with pine forests, cypress swamps, prairies, and inundated marshes. Farther north the surface becomes more elevated, and in many places hilly and broken, but not mountainous. A range of bluffs stretches along the Mississippi River; they are an extension of the table lands which spread over the state. The great staple production of this state is cotton; but corn, bananas, sweet potatoes, tobacco, indigo, and fruits are cultivated.

Jackson, the capital of Mississippi, is situated at the head of boat navigation on the Pearl River. *Natchez* is the largest and most commercial town in the state, situated on the east bank of the Mississippi, 292 miles above New Or′leans Along the river at the foot of the bluff, which rises 200 feet from the water, there are stores, warehouses, and other buildings; but the more respectable part of the city occupies the top of the elevation, which affords fine places of residence, and a beautiful view of the river and its banks. Lat. 31° 34′ N., lon. 91° 24′ 4″ W. Distance from Washington, 1146 miles. Vicksburg, Port Gibson, and Yäzôô′ City are places of note.

§ 25. LOUISIANA.

Extent, from 29° to 33° N. lat., and from 88° 40′ to 94° 25′ W. lon.
Area, 44,215 square miles. Population, 517,839.

LOUISIANA is bounded on the N. by Arkansas and Mississippi States; E. by the Mississippi and Pearl Rivers, which separate it from Mississippi State, and by the Gulf of Mexico; S. by the Gulf; and W. by Sabîne′ River, which separates it from Texas. This is one of the most important states of the Union. It was first settled at Iberville′, in 1699. It became a state in 1812. Louisiana consists of inundated and dry lands. Above the mouth of the Red River, the tract liable to periodical inundation is narrow; but below that stream it widens and expands like a fan, and finally embraces the whole of the Gulf border. All of the soil sufficiently elevated for cultivation within the inundated region is of

---

production. Other articles. Jackson. Natchez. Other places. — LOUISIANA. Extent, &c. Its boundaries. Rank. Of the inundated and dry lands. Coast.

superior quality. The northern part of the state has an undulating surface. The country between the Mississippi, Ibervîlle′, and Pearl Rivers is an important part of the state. The southern or level portion is highly productive of the staple crops, and the northern portion, which is undulating, has been considered as the " Garden of Louisiana."

The coasts are indented with numerous large bays, and lined with islands and sand bars. Lakes Pontçhartrāin′, Mau′repäs, Börgne, Chetimä′ches, Mermentau′, Căl′casiu, and Sabîne′, all lie south of 30° N. lat. The Mississippi runs through the middle of the state, and divides into several mouths before reaching the Gulf of Mexico. The Red River crosses the state from west to east, flowing into the Mississippi 240 miles above New Orleans. To protect the country from inundation, levees or embankments are raised along the shores. The staple productions of Louisiana are cotton, sugar, molasses, tobacco, and rice. The manufactures are principally for the supply of the immediate wants of the community.

New Or′leans, the commercial metropolis of Louisiana, is situated on the left bank of the Mississippi River, 100 miles from its mouth. From its form, as it extends along the bend of the river, it is sometimes called the " Crescent City." The levee or quay extends for four miles along the bank of the river, and presents an unexampled scene of activity. It is the great receiving and distributing depot of the interior of the United States, and the greatest cotton market in the world. By its geographical position it sustains extensive commercial relations to the West Indies, South America, Mexico, and the southern parts of North America. The inhabitants consist of Americans, French, Spanish, Creoles, and the colored races of every shade. Lat. 29° 57′ 30″ N., lon. 90° W. Distance from Washington 1203 miles. Population, 119,461.

Bă′ton Rôuge′, the capital of Louisiana, occupies a pleasant slope on the east side of the Mississippi, 117 miles northwest of New Orleans. It is a military station and seat of a college. Donaldsonville, Madisonville, Alexandria, Opelôu′sas, and St. Martin's are among the other noted places in this state.

Lakes. Mississippi River. Red River. Levees. Productions. New Orleans. Inhabitants. Baton Rouge. Other towns. — TEXAS. Extent, &c. Bounda-

§ 26. TEXAS.

Extent, from 27° to 42° N. lat., and from 91° 26′ to 106° W. lon.
Area, 325,520 square miles. Population, 212,592.

TEXAS is bounded N. by Red and Arkansas Rivers, which separate it from the Indian Territory; E. by Louisiana; S. by the Gulf of Mexico; and W. by the Rî′o del Nōr′te, which separates it from Mexico. This country was formerly a province of Mexico; it became independent in 1836. It afterwards sought for admission into the United States, which was granted by Congress in 1845. The general aspect of this state is that of a vast inclined plane, gradually sloping eastward from the mountains on the western border. It comprises three essentially different regions. Along the coasts and far inland it is low and level, but free from marshes and swamps, and composed of excellent arable and pasture lands and prairies. The soil is a deep, black mould, and of great fertility. In the north the lands are considerably elevated, and the surface undulating. The prairies of this section are covered with vast forests. On the west and south-west is the mountainous region, being crossed by the Sier′ra de Sa′ba. There are few countries of the same extent which have so small a portion of land unfit for cultivation, and no country is better supplied with river conveniences. The climate is essentially tropical, except in the more northern parts. Cotton and sugar cane are the agricultural staples. Most kinds of grain and fruit grow luxuriantly in the interior. Silver, iron, coal, and bitumen are among the minerals. Buffaloes and wild horses exist in vast numbers on the prairies.

Austin, the capital of Texas, is situated on the Colorä′do River, 200 miles north-west of Găl′veston. Galveston is the chief commercial place in the state. It is situated on the north-east part of Galveston Island. The entrance to the bay is deep and spacious, affording a good harbor and anchorage. Lat. 29° 18′ 14″ N., 94° 46′ 34″ W. lon. Hôus′ton, Sabîne′, Bex′ar, and Cor′pus Chris′ti are noted places.

---

ries. History. Face of the country. Three regions. Mountains. Advantages. Productions. Minerals. Animals. Austin. Galveston. Other places.

EXERCISES IN VOYAGES AND TRAVELS.

By railroad from Washington to Philadelphia. From Baltimore to Cumberland. From Fredricksburg, Va., to Wilmington, N. C. From Charleston, S. C., to Atlanta, Ga. From Savannah to Macon. To Chattanooga. Describe the two principal travelling routes from Baltimore to Charleston. The route from thence to New Orleans. From Savannah to Nashville. Transportation of merchandise from Pittsburg to Tuscumbia, Ala. A ship freighted with whale oil from New Bedford to Savannah. A cargo of tobacco from Richmond, Va., to Portland, Me. A cargo of tar from Wilmington, N. C., to the navy yard at Boston. A ship load of granite from Hallowell, Me., to Galveston, Tex. Transportation of rice from Savannah to Buffalo. Of cotton from Charleston, S. C., to York, Me. Also from New Orleans to Lawrence, Mass.

§ 27. THE STATES OF THE INTERIOR.

These states have heretofore been called the Western States; but since the extension and rapid increase of settlements beyond the Rocky Mountains, the term "western" is no longer appropriate. The STATES OF THE INTERIOR have no sea coast; some of them, however, have a large extent of lake coast. They occupy the basins of the Mississippi, Ohio, and Missouri Rivers, and at present (1855) comprise the States of Ohio, Indiana, Illinois, Michigan′, Wisconsin, Kentucky, Tennessee, Arkan′sas, Missouri, and Iō′wa, with the Minnesō′ta, Nebraska, Kansas, and Indian Territories. Nearly the whole extent of this region presents a series of plains or prairies, inclining only in the direction of the great lakes and rivers. The soil is of great depth and fertility. This section is the grăn′ary of the United States; and it is scarcely possible to set limits to the breadstuffs which it is capable of producing. Inexhaustible supplies of the most valuable minerals exist beneath the surface of the earth — lead, copper, iron, coal, and lime. With these vast resources of wealth, and the great avenues of commerce afforded by the great lakes and noble rivers, the States of the Interior are destined to rival, if not to excel, in importance any of the border states.

— STATES OF THE INTERIOR. Remark. Sea coast. Lake coast. River basins. States and territories comprised. Face of the country. Soil. Granary. Minerals. Future. — OHIO. Extent. Boundaries. Comparative

§ 28. Ohio.

Extent, from 38° 34′ to 42° N. lat., and from 80° 35′ to 84° 57′ W. lon. Area, 39,964 square miles. Population, 1,980,408.

Ohio is bounded on the N. by Michigan and Lake Erie; E. by Pennsylvania; S. E. and S. by Ohio River, which separates it from Virginia and Kentucky; and W. by Indiana. This flourishing state is the most north-easterly of the States of the Interior. It was first settled at Marietta, in 1788, and in 1802 it became a member of the Union. The northern parts of the state, bordering on Lake Erie, and the middle portions, are generally level, and in some places wet and marshy. The eastern and south-eastern parts, near the Ohio River, are very uneven, often rising in abrupt and broken hills, though it is not mountainous. The most extensive prairies are on the head waters of the Muskingum and Sciō′ta, and near the sources of the Miami, in the N.W. part of the state. The soil is exceedingly fertile, and nearly all of it is susceptible of cultivation. Ohio is an agricultural state. Wheat, corn, and pork are the staple articles of trade. Iron, bituminous coal, salt, and other minerals are abundant. The manufactures of Ohio are already of considerable importance, and are rapidly increasing both in variety and extent.

Columbus, the capital, is situated on the left bank of the Sciō′ta River, near the centre of the state, 110 miles from Cincinnä′ti, and 396 miles from Washington. A large public square of 10 acres, in the centre of the city, is formed by the intersection of rectangular streets, and contains the public edifices. Columbus owes much of its prosperity to its being the seat of government. Lat. 39° 57′ N., lon. 83° 3′ W. Distance from Washington, 396 miles.

Cincinnati, the largest city of the States of the Interior, is beautifully situated on the north bank of the Ohio, in the S.W. part of the state. It is the centre of trade for a large extent of country, and is the greatest pork market in the world. Near Cincinnä′ti are several thriving villages and towns, which are connected with it in prosperity and interests. Lat. 39° 5′ 54″ N., lon. 84° 27′ W. Distance from Washington, 497 miles. Population, 115,436.

Cleveland is situated on an elevated plain at the entrance of Cuyahō′ga River into Lake Erie. Its harbor is one of the

---

view. Face of the country. Prairies. Soil. Productions. Minerals. Manufactures. Columbus. Cincinnati. Cleveland. Other towns. — Indiana.

best on the lake, spacious and safe. The city is beautifully laid out, and the streets are so well shaded by forest trees, as to give it the appellation of the "Forest City." Sandusky is one of the principal ports on Lake Erie. Zanesville, on the Muskingum, Dayton on the Miăm'i, and Chillicō'the on the Sciō'ta, are all large and flourishing manufacturing towns.

§ 29. INDIANA.

Extent, from 37° 45′ to 41° 52′ N. lat., and from 84° 42′ to 88° 12′ W. lon. Area, 33,809 square miles. Population, 988,416.

INDIANA is bounded on the N. by the Lake and State of Michigan; E. by Ohio; S. by the Ohio River, which separates it from Kentucky; and W. by Illinois. In features, soil, and climate, Indiana forms a connecting link between Ohio and Illinois. It is more hilly than the latter, but contains no mountains. A range of high land called the "Knobs" extends from the falls of the Ohio to the Wabash, which in many places produces a broken surface. Bordering on all the streams, except the Ohio, are belts of lowland and prairie. Between the Wâ'bash and Lake Michigan' the country is generally level, abounding alternately in woodlands, prairies, lakes, and swamps. No state in the Union can show a greater extent of fertile land, in one body, than Indiana. The staple productions are horses, mules, neat cattle, sheep, swine, grain, and the products of the dairy. Iron, coal, and epsom salts are among the minerals.

Indianapolis, the capital, is pleasantly situated on the White River, near the centre of the state, and is distinguished for its rapid growth and prosperity. No less than seven railroads centre here, communicating with important places within and beyond the limits of the state. Lat. 39° 55′ N., lon. 86° 5′ W. Distance from Washington 573 miles.

New Albany, on the Ohio, two miles below the falls, is one of the most important places in the state. Great numbers of steamboats are here built and repaired. It exhibits all the signs of enterprise and prosperity.

Madison, on the Ohio, is pleasantly situated on a high bank, above the reach of the floods, and is one of the most flourishing places on the river. It is connected with Indianapolis by railroad. Evansville, in the S.W. part of the state, is a

---

Extent, &c. Boundaries. Compared with Ohio and Illinois. The "Knobs." Lowland and prairie. Productions. Minerals. Indianapolis. New Albany.

large manufacturing and commercial city. It is situated at the termination of the Wâ′bash and Erie Canal. Harmony, Vincĕnnes′, Têrre Haute, and Logansport are flourishing towns on the banks of the Wâ′bash. Fort Wayne, on the Mâu′mee, and Michigan City, on Lake Michigan, are also noted places.

§ 30. ILLINOIS.

Extent, from 37° to 42° 30′ N. lat., and from 87° 49′ to 91° 30′ W. lon. Area, 55,409 square miles. Population, 851,470.

ILLINOIS is bounded on the N. by Wisconsin; E. by Lake Michigan and the State of Indiana; S. E. and S. by the Ohio River, which separates it from Kentucky; and W. by the Mississippi River, which separates it from Iō′wa and Missouri. The French settlements of Kaskăs′kia and Cahō′kia were made in the early part of the 17th century, but were never important. Illinois became one of the states in 1818. The surface of this state may be regarded as a gentle plain, more or less rolling, inclined in the direction of its rivers. It is estimated that two thirds of the state are covered with prairie lands, presenting every degree of fertility, down to extreme barrenness. The northern and southern sections are somewhat broken, but no portion of the territory is traversed by ranges of highlands. The forests abound in oak of various kinds, and other trees. Lead is a very important mineral production of this state; the Galē′na mines are the richest in the world. Copper and iron ores exist, and coal abounds in the bluffs. Fine salt springs exist in the southern part of the state. Wheat, corn, and other grains, horses, mules, neat cattle, sheep, and swine, are the staple productions.

Springfield, the capital, is situated on the border of a beautiful plain, very near the centre of the state. It is one of the most pleasant towns in the west; it is laid out with broad and shaded streets, interspersed with spacious lawns and squares, all things indicating prosperity and vigorous health. Lat. 39° 48′ N., lon. 89° 33′ W. Distance from Washington 801 miles.

Chicâ′go is situated in the N. E. part of the state, on the west side of Lake Michigan′, and occupies both sides of the river, from which it takes its name. It stands on the border

---

Madison. Evansville. Other towns. — ILLINOIS. Extent. Its boundaries. Early settlements. Surface. Prairies. Trees. Minerals. Productions. Spring-of a prairie, elevated a little above the level of the lake. Few towns have a more advantageous position. The Illinois and Michigan′ Canal, by connecting the navigation of the lake with that of the great river of the state, has contributed largely to the growth of Chicâ′go. The branches of commerce in which it is most extensively engaged are lumber, grain, and cattle. Lat. 42° N., lon. 87° 35′ W. Distance from Washington 763 miles. Population, 29,963. Alton and Quincy, places of extensive trade, and Galē′na, noted for its valuable lead mines, are on or near the Mississippi River. Peō′ria and Peru, on the Illinois, are flourishing towns.

§ 31. Michigan.

Extent, from 41° 48′ to 47° 30′ N. lat., and from 82° 20′ to 90° 10′ W. lon. Area, 56,243 square miles. Population, 397,654.

Michigan consists of two distinct peninsulas. The southern peninsula is bounded N. by the Straits of Mackinaw, which separates it from the upper peninsula; N. E. by Lake Huron, which separates it from Canada West; E. by Lake Huron, the River and Lake St. Clair, Detroit River, and Lake Erie, which also separate it from Canada West; S. by Ohio and Indiana; and W. by Lake Michigan. The northern peninsula, which is annexed to Michigan′ proper merely for the temporary purposes of civil government, is bounded N. by Lake Superior; E. by St. Mary's River, which separates it from Canada West; and S. by Wisconsin, Lake Michigan′, Mackinaw Strait, and Lake Huron. The surface of Michigan′ proper is less varied than any other section of equal extent in the Union. It is divided into two gently inclined planes, one sloping towards Lake Michigan′ on the west, the other towards the lakes on the east. The greater portion of the country is covered with dense forests, the soil of which is good.

The northern peninsula is diversified by mountains, hills, valleys, and plains. The Porcupine Mountains, with an elevation of 1800 to 2000 feet, run nearly throughout the length of the peninsula, descending towards the shores of Lake Superior and Lake Michigan′. From its high latitude and sterile character, this section does not promise much to agriculture; but its mineral treasures are invaluable. Rich veins of copper, blended more or less with silver, occur at Keweenaw Point,

---

field. Chicago. Other towns. — Michigan. Extent. Two peninsulas. Boundaries of the southern peninsula. Of the northern. Surface of Southern Mich-

Eagle River, Isle Royale, and in other parts of the peninsula. From one of the veins of the Copper Falls mines a single mass of native copper has been taken which weighed 30 tons: it was perfectly pure. The chief productions of the southern peninsula are horses, mules, neat cattle, sheep, swine, with wheat, corn, and other grains. Situated on the four great lakes of Huron, Superior, Michigan, and Erie, this state possesses advantages for commerce unsurpassed by any inland state in the Union. Its foreign trade is confined to the British Provinces. An immense traffic is carried on in lumber with the Eastern and Southern States.

Lansing, the capital of Michigan′, is situated on Grand River, near the centre of the state. It is 95 miles N. W. of Detroit, and 80 miles from Lake Michigan.

Detroit is situated on the west bank of Detroit River, 18 miles from Lake Erie. It is an important metropolis of the States of the Interior, and is destined to hold a still higher rank. Several hundred steamboats and other vessels, from various places on the lakes, visit Detroit during the season of navigation. Lat. 42° 19′ 45″ N., lon. 83° 2′ 30″ W. Distance from Washington 526 miles. Population, 21,019.

Ypsilăn′ti, containing the State Normal School; Ann Arbor, the seat of the State University; Jackson, containing the State Penitentiary; Marshall, Kalamazôô′, Paw-Paw, and Niles are all large and flourishing towns, through which the Central Railroad passes. Mackinaw, on the strait, is a United States military post; the Indians assemble here annually to receive their annuity from the United States government.

§ 32. WISCONSIN.

Extent, from 42° 30′ to 47° N. lat., and from 87° to 92° 40′ W. lon. Area, 53,924 square miles. Population, 305,191.

WISCONSIN is bounded on the N. by Minnesota, Lake Superior, and Northern Michigan; E. by Lake Michigan; S. by Illinois; and W. by the Mississippi River, which separates it from Iō′wa and Minnesō′ta. This state is one vast plain, elevated from 600 to 1500 feet above the Gulf of Mexico, and varied only by river hills and the gentle swells and undulations of the country. In the northern part of the state

---

igan. Surface of the northern section. Its resources. Productions of the southern section. Advantages of situation. Trade. Lansing. Detroit. Ypsilanti, and other towns. — WISCONSIN. Extent. Its boundaries. Surface. Adthe surface is diversified by hills and valleys. In the southern and central parts the surface consists of prairies, meadows, and timber lands, and the soil is not surpassed in fertility by any portion of the Union. The salubrity of the climate, the purity of the air and of the water, the coolness and short duration of the summers, and the dryness of the winters, conspire to render Wisconsin one of the most favored regions of the United States. The south-west portion of the state is one vast mine of lead, extending over a region of 100 miles in circumference. The copper mines in the north, bordering on Lake Superior, are among the richest in the world.

Madison, the capital, is pleasantly situated between two beautiful lakes, about midway between Lake Michigan and the Mississippi. *Milwaukee*, the chief city of Wisconsin, is finely located for commerce on both sides of Milwaukee River, at its entrance into Lake Michigan. It is the market for a large part of the productions of the state. Lat. 43° 3′ 45″ N., lon. 87° 57′ W. Distance from Washington, 700 miles. Population, 20,061. Prăĭ′rie du Chiĕn′, upon the Mississippi, is situated on a beautiful prairie, upon which may be seen several artificial mounds of great antiquity. Janesville, Beloit, Green Bay, and Fŏnd du Lăc are all flourishing places.

§ 33. IOWA.

Extent, from 40° 30′ to 43° 30′ N. lat., and from 90° 20′ to 96° 50′ W. lon. Area, 50,914 square miles. Population, 192,214.

IOWA is bounded on the N. by Minnesota; E. by the Mississippi, which separates it from Wisconsin and Illinois; S. by Missouri and the lower course of Des Moines River; and W. by the Missouri and Sîoux Rivers, which separate it from Nebraska and Minnesō′ta. The general surface of Iō′wa is moderately undulating, without mountains or high hills, except in the northern part. Along the margins of the rivers there are frequent ranges of bluffs, varying in height from 40 to 130 feet. In other instances the streams are skirted by rich lowlands, covered with trees. A large proportion of the state consists of prairies, some of which have a level, others a rolling surface. The soil in the lowlands, as well as on the prairies, is generally good, the former consisting of a

---

vantages. Lead and copper. Madison. Milwaukee. Prairie du Chien. Other towns. — IOWA. Extent. Boundaries. Face of the country. Productions.

deep, rich, black mould, and the latter of a sandy loam. Iō′wa produces luxuriant crops of corn, wheat, and oats. Lead is the principal mineral, and is found in the vicinity of Dubūque′, and along the Upper Mississippi. Coal, limestone, and iron ore are also found.

Iō′wa City, the capital, is finely situated on the Iō′wa River. The location is beautiful, rising on a succession of elevated terraces, overlooking a splendid country. Dubūque′, the chief commercial town on the Upper Mississippi, is situated in the lead mine region. It stands on a prairie, having several bluffs in the rear, some of which are adorned with elegant mansions. Burlington, on the Mississippi, is the oldest town in the state. It possesses great commercial advantages. Keokuk, Davenport, Mount Pleasant, Muscatīne′, and other towns are rapidly increasing in population.

§ 34. MISSOURI.

Extent, from 36° 30′ to 40° 30′ N. lat., and from 89° 20′ to 96° W. lon. Area, 65,037 square miles. Population, 682,044.

MISSOURI is bounded on the N. by Iowa; E. by the Mississippi, which separates it from Illinois and Kentucky; S. by Arkansas; and W. by the 96th meridian and Missouri River, which separates it from the Indian Territory, Kansas, and Nebraska. This state, in the north-western part, is a wild prairie. The central and south-western portions are hilly and broken, being traversed by ridges of the Ozärk′ Mountains. The south-east is low, swampy, full of lakes, and subject to inundation. The best portion of the state lies between the Mississippi and Missouri Rivers, which has an undulating surface, with large tracts of alluvial and hilly prairies. Missouri is rich in agricultural and mineral resources. Its chief productions are corn, hemp, and tobacco. Large herds of cattle, swine, and horses feed on the prairies, The lead, iron, and coal mines are inexhaustible. The celebrated Iron Mountain and Pilot Knob yield 80 per cent. of pure iron.

Jefferson City, the capital, is on the Missouri River, near the centre of the state. St. Louis is situated on the west bank of the Mississippi, 20 miles below the mouth of the

---

Minerals. Iowa City. Dubuque. Burlington. Other towns. — MISSOURI. Extent. Boundaries. Face of the country. Mountains. Resources. Iron Mountain and Pilot Knob. Jefferson City. St. Louis. St. Charles. Other

Missouri, and 180 above the mouth of the Ohio. Its commercial position and advantages are remarkable. It is the entrepot of a vast trade from the valleys of the Ohio and Missouri Rivers. Lat. 38° 37′ 28″ N., lon. 90° 15′ 16″ W. Distance from Washington 856 miles. Population, 77,864. *St. Charles*, formerly the capital, is on the Missouri River, 20 miles from its mouth, and is a noted town. Independence, New Madrid, and St. Genevieve are also important places.

§ 35. ARKANSAS.

Extent, from 33° to 36° 30′ N. lat., and from 89° 30′ to 94° 30′ W. lon. Area, 54,500 square miles. Population, 209,639.

ARKANSAS is bounded on the N. by Missouri; E. by the Mississippi River, which separates it from Tennessee and Mississippi; S. by Louisiana; and W. by Texas and the Indian Territory. The surface of this state is considerably diversified. In the eastern part, for about 100 miles from the Mississippi, the country is low and wet, and much of the land is subject to inundation. With the exception of some prairie, this portion is covered with dense forests. The soil here, where arable, is of the most productive kind. In the middle of the state the surface is uneven and broken, and in the western parts it is mountainous and hilly, interrupted by timber lands, prairies, and barren plains. In some respects Arkăn′sas may be regarded as a barren country, if we except the soil along the margin of the rivers, which is generally fertile. The chief mountains are the Ozärk′, which lie at the N. W. corner, rising to a height of 2000 feet. A range of hills, called the Black Mountains, extends between the Arkăn′sas and White Rivers. The principal rivers that traverse this state are the Arkăn′sas, Wachitâ′, White, and St. Francis. The hot springs near the sources of the Wachitâ′ are much resorted to by invalids. The staple productions are cotton, grain, cattle, and horses. Its minerals are iron ore, lead, gypsum, salt, and coal.

Little Rock, the capital, is situated on a high bluff, on the south side of the Arkăn′sas River, at the head of steamboat navigation, 300 miles from its mouth. Lat. 34° 40′ N., lon. 92° 12′ W. Distance from Washington 1068 miles. Van

---

places. — ARKANSAS. Extent. Boundaries. Surface. Ozark Mountains. Black Mountains. Rivers. Springs. Productions. Minerals. Little Rock.

Buren, Batesville, Fayetteville, Helena, and Fulton are important places.

§ 36. KENTUCKY.

Extent, from 36° 30′ to 39° 10′ N. lat., and from 82° to 89° 35′ W. lon.
Area, 37,680 square miles. Population, 982,405.

KENTUCKY is bounded on the N. by the Ohio River, which separates it from Illinois, Indiana, and Ohio; E. by Virginia; S. by Tennessee; and W. by Missouri. The territory of this state was formerly a part of Virginia, and was explored by Daniel Boone, in 1792. It lies entirely in the Valley of the Ohio, and is a part of an immense inclined plane, more or less broken in its surface, descending from Cumberland Mountains to the River Ohio. The hills are gently rounded, and are fertile quite to their tops, having narrow valleys between them of great fertility. The whole state below the mountains rests on a bed of limestone, in general about eight feet below the surface. In the S. W. part of the state, between Green and Cumberland Rivers, are several wonderful caverns. The "Mammoth Cave," in Edmonson county, 130 miles from Lexington, is nine or ten miles in extent, with a great number of avenues and intricate windings. Most of the caves yield an inexhaustible supply of nitre, which is one of the ingredients in the manufacture of gunpowder. The principal rivers are the Ohio, Mississippi, Tennessee, Cumberland, Kentucky, Green, Salt, Licking, Rolling, and Big Sandy. The staples are corn, tobacco, hemp, and wheat. Among the mineral resources are iron, coal, salt, saltpetre, and lime. The salt springs are numerous.

Frankfort, the capital, is situated on a circular bend on the north side of Kentucky River, 60 miles from the Ohio. Behind the town the plain rises several hundred feet into a table land, from which appears a magnificent prospect of the river, and a wide extent of country. The citizens of Frankfort display the accustomed intelligent hospitality which is a characteristic of Kentuckians. Population, 4372.

Louisville is the great commercial city of the state. It is situated on the south bank of the Ohio River, immediately above the falls. This city may be regarded as one of the

---

Other towns. — KENTUCKY. Extent. Its boundaries. History. Situation. Surface. Geological basis. Caverns. Rivers. Productions, &c. Frankfort.

great magazines for provisions in the interior. It is the market for a vast agricultural region, and trades extensively with the whole valleys of the Ohio and Mississippi. The Portland Canal enables vessels from below to avoid the rapids of the Ohio in ascending and descending the river. Lat. 38° 3′ N., lon. 85° 30′ W. Distance from Washington 590 miles. Population, 43,194.

Lexington, the oldest settlement in the state, is situated in the midst of a most beautiful and fertile country, on a branch of the Elkhorn River, 70 miles from Louisville. It is the seat of Transylvania University. Maysville, on the Ohio, as also Covington and Newport, are flourishing towns.

§ 37. TENNESSEE.

Extent, from 36° to 37° 42′ N. lat., and from 81° 30′ to 90° 10′ W. lon. Area, 44,000 square miles. Population, 1,002,625.

TENNESSEE is bounded on the N. by Kentucky and Virginia; E. by North Carolina, of which it was formerly a part; S. by Georgia, Alabama, and Mississippi; and W. by the Mississippi River, which separates it from Arkan′sas and Missouri. It became a state in 1796. This state is greatly diversified in surface, soil, and climate. The eastern part abounds in mountains and hills, some of them lofty, and presenting scenery peculiarly grand and picturesque. The middle section is less bold in its features; though hilly, it gradually becomes undulating, and even level towards the north. The soil of the western division is black and rich; in the middle section there are large extents of excellent land, and in the eastern or mountainous parts, the soil is generally thin, except in the valleys, where it is exceedingly fertile. The Cumberland Mountains intersect the state, extending from S. W. to N. E. The principal rivers are the Mississippi, Cumberland, Tennessee, Clinch, Holston, Duck, French, Broad, and Hiwâs′see. Cotton, tobacco, and hemp are the staples. Of minerals, iron, gold, coal, salt, and saltpetre are the principal.

Nashville, the capital and largest city, enjoys an extensive trade. It is situated on the Cumberland River, 122 miles from its mouth. Few southern cities combine a pleasant situation with more attractive hospitality and refinement, or

---

Louisville. Lexington. Other places. — TENNESSEE. Extent. Boundaries. Surface. Soil. Rivers. Products. Nashville. Memphis. Knoxville. —

display a greater number of elegant public structures, than Nashville. Lat. 36° 9′ 33″ N., lon. 86° 49′ 3″ W. Distance from Washington 714 miles. Population, 10,478.

Memphis, in the S. W. corner of the state, on the Mississippi, is a place of considerable trade. One of the United States naval stations is here. Knoxville, on the Holston, was formerly the capital.

§ 38. Minnesota Territory.

Extent, from 42° 30′ to 49° N. lat., and from 91° to 103° W. lon. Area, 141,839 square miles. Population, 6077.

Minnesota is bounded on the N. by British America; E by Lake Superior and Wisconsin, from which it is separated in part by the Mississippi River; S. by Iō′wa; and W. by Nebraska, from which it is separated in part by the Missouri River. This territory was organized under its present name in 1849. *St. Paul* is the capital and chief town, situated on the Mississippi River, 8 miles below the Falls of St. Anthony. Minnesō′ta is an elevated table land, with a surface but little varied, being mostly a rolling prairie, abounding with lakes of pure water, and streams which flow in all directions, excepting towards the west. The soil is a fertile sandy loam, easily cultivated, and well adapted to agricultural purposes. The Mississippi River rises centrally in the territory, in Itas′ka Lake, a beautiful sheet of water. The waters of this territory pass off, some to Hudson's Bay, some to Lake Superior, and some to the Gulf of Mexico. Forests of pine and other valuable woods for timber border the principal streams; and iron, lead, and copper ores are found in the eastern section.

§ 39. Nebraska Territory.

Extent, from 40° to 49° N. lat., and from the Missouri River on the east to the main ridge of the Rocky Mountains on the west. Area, 275,000 square miles.

Nebraska is bounded on the N. by British America; E. by Minnesota, Iowa, and Missouri; S. by Kansas; and W. by Utah, Oregon, and Washington. This territory was or-

---

Minnesota Territory. Extent. Its limits. St. Paul. Physical aspects. Watercourses. Resources. — Nebraska Territory. Extent. Boundaries.

ganized under its present name in 1854. The face of the country is that of rolling prairie, but little diversified except by the streams intersecting it. The soil, for 50 to 100 miles west of the Missouri River, is like that of Iowa and Missouri. The highlands are open prairies, covered with grasses; the river bottom is a deep, rich loam, shaded by dense forests. A spur of the Rocky Mountains, called the Wind River chain, passes from Frĕm′ont's Peak in an easterly, and thence in a northerly direction, and is continued in the gentle undulations of the Black Hills to the N. E. border, thus forming the basin of the Upper Missouri and Yellow Stone Rivers. The valley of the Yellow Stone is the garden spot of Nebraska. The Nebraska or Platte River rises in the Rocky Mountains, in the S. W. part of the territory, and flows eastward to the Missouri. Its bed is so shallow and unstable, from its quicksands, as to be almost useless for commercial purposes. The Platte River valley is generally a dead flat, elevated only from 18 to 26 inches above the surface of the stream, and the greater portion liable to inundation. From the city of St. Louis, travelling either northward or westward, the climate becomes colder about in the same degree — the difference of elevation travelling west being about equal in its effects to the difference of latitude travelling north. Snow falls at the foot of the mountains about the first of September, and at Council Bluffs about the first of November.

§ 40. KANSAS TERRITORY.

Extent, from 37° to 40° N. lat., and from the west boundary of Missouri State to the crest of the Rocky Mountains.
Area, 122,000 square miles.

This territory is drained by the main branch of the Arkansas, by the Kansas, and by head tributaries of the Platte (south fork) Rivers. The surface is level, consisting of an immense plain, with a gentle slope from the base of the Rocky Mountains to the Missouri border, and the abrupt descent from the mountain ridge to the base. The soil is various, comprising rich alluvial bottom lands bordering the streams, some fertile prairie lands, and extensive sandy plains. Kansas was erected into an organized territory in 1854.

Face of the country. Highlands. River basins. Platte River. Climate. — KANSAS. Extent. Rivers. Surface. Soil. When organized. — INDIAN

§ 41. INDIAN TERRITORY.

This is a tract of country west of the settled portions of the United States, which has been set apart by the General Government for the permanent residence of those Indian tribes that have been removed chiefly from the south-western states. Here they are secured in governments of their own choice, subject to no other control from the United States than such as may be necessary to preserve peace on the frontier and between the several tribes. It extends from Red River on the south to lat. 37° N., and from the States of Arkansas and Missouri on the east to 100° W. lon. Area, 187,171 square miles. The tribes of the Chickasaws, Choctaws, Creeks, Seminoles, and Cherokees are the principal occupants.

EXERCISES IN VOYAGES AND TRAVELS.

By steamboat from Pittsburg to Cairo. By railroad from Sandusky to Cincinnati. By steamboat from Detroit to Chicago. From Detroit to Buffalo. By railroad from Cincinnati to Cleveland. From Cleveland to Pittsburg. From Sandusky City to Chicago. From Indianapolis to Madison. From Louisville to Frankfort. A ship freighted with ice from Boston to Mobile. Transportation of pork from Cincinnati to Baltimore. Of lead from Galena and Dubuque to New York. Of copper from the mines of Lake Superior to Pittsburg. Of French goods imported into New York to be transported by water to Chicago. Transport a shipment of furs from the head waters of the Yellowstone to St. Louis, and thence to Boston. A consignment of sugar from New Orleans to a merchant in Milwaukee. Transportation of 20 pieces of carpeting from Lowell to Detroit. A company of emigrants from New York city to Burlington, Iowa. How may wheat from Peoria, Ill., be sent to Providence, R. I.?

§ 42. THE PACIFIC STATES AND TERRITORIES.

This section embraces all that tract of country which lies between the crest of the Rocky Mountains and the Pacific Ocean. It is bounded on the north by the 49th parallel of latitude, and Straits of Juan de Fuca, and extends south as far as the 31st degree of north latitude. It comprises the

---

TERRITORY. Purpose. Extent. Tribes inhabiting it. — PACIFIC STATES AND

State of California, and the Territories of Oregon, Washington, Utah, and New Mexico. It possesses a diversity of surface, soil, and climate. That portion occupied by Oregon and Washington has belonged to the United States for many years, and has remained till recently a wilderness. The part now known as California, New Mexico, and Utah was ceded to the United States by Mexico, February 2, 1848. The existence of gold in California was discovered immediately after, and the population increased with unexampled rapidity. Never has a single event produced such wonderful results in so short a time. In 1849 a convention assembled, and a constitution was formed. This was immediately ratified by the people, and in 1850 California was admitted as a state into the Federal Union. At the same time New Mexico and Utah were organized as territories. In 1853, owing to the increase of population consequent to the "gold discovery," Oregon was divided, and the part north of Columbia River organized as the Territory of Washington. The valley of the Willamĕtte′ is the most fertile portion of Oregon. The gold region, so far as known, lies in the valley of the Sacramento and San Joaquîn′ Rivers, occupying a large area. Besides gold, there are inexhaustible mines of silver, quicksilver, lead, copper, and iron. The present condition of the country affords but slight means for forming correct opinions of the agricultural capacity and fertility of the soil.

§ 43. CALIFORNIA.

Extent, from 32° 40′ to 42° N. lat., and from 114° to 124° W. lon. Area, 188,982 square miles. In 1852 the population was 264,435.

CALIFORNIA is bounded on the N. by Oregon; E. by Utah and New Mexico; S. by Mexico; and W. by the Pacific Ocean. The greater part of the state is hilly or mountainous. The most prominent range of mountains is the Siĕr′ra Nevä′da, lying nearly parallel with the coast, and from 100 to 200 miles distant. On the western slope of this range are the principal gold mines, extending 400 or 500 miles in length, and 50 or 60 in width. The slope of the Siĕr′ra is broken, by the numerous tributaries of the Sacramĕn′to and San Joaquîn′ Rivers, into deep gorges and ravines, and the sur-

---

TERRITORIES. Extent. Comprises what? Of Oregon and Washington. Of the remainder. Gold. When discovered. Convention in California. Result. New Mexico and Utah. Division of Oregon. Locality of the gold region. Other metals. Remark. — CALIFORNIA. Extent. Boundaries. Surface.

face of the region is extremely rugged and uneven. The great valley of the Sacramĕn'to and San Joaquîn' is 500 miles in length, and 50 or 60 in width; it is very level, has but little timber, and though fertile in some parts along the borders of the streams, it is elsewhere either arid and unproductive, or consists of extensive, low, alluvial marshes thickly covered with rushes. On the west of this great valley is the coast range of hills and mountains, which in some parts are 3000 feet high, and run parallel with the coast, at a distance of 30 to 60 miles. These hills are interspersed with numerous valleys, some of which are of great fertility and beauty.

Although the soil of this state is not generally adapted to the purposes of agriculture, yet there is land enough of the finest quality to supply a large population with their ordinary vegetable wants. The vine flourishes in different parts of the state, and wine has long been made at Los Angeles, and in other places. The various vegetables and fruits of the temperate zone flourish finely, and in the southern counties many tropical productions may be successfully cultivated. California seems by nature peculiarly adapted for grazing; but under judicious cultivation its agricultural resources are very great.

The coast range of mountains and the valleys of the Sacramĕn'to and San Joaquîn' abound in deer, elk, antelopes, and other wild game, and the plains are traversed by immense herds of wild horses. The formidable grisly bear is found in all parts of the state. The cattle of the country are fine, and are owned by native Californians, often in herds of many thousands. These were formerly killed in great numbers for their hides and tallow, which constituted the principal exports of the country, and the chief source of wealth to the inhabitants.

MINERALS.— Silver, lead, copper, platinum, and other mines have been discovered in California, (though not yet worked;) but the great mineral wealth of the state consists in its mines of gold and quicksilver. Although the existence of gold in this country had long been known, it never attracted general attention before 1848, when it was discovered near Sŭt'ter's Mill, on the south fork of the American River. Since that time it has been found on all the principal eastern branches of the Sacramĕn'to and San Joaquîn', as well as in the coast range on the tributaries of the Trinity and Klä'math Rivers,

---

Sierra Nevada. Western slope. Streams. Valley of the Sacramento and San Joaquin. Coast range. Soil. Vine. Vegetables. Animals. Minerals.

in the northern part of the state. The gold is found under two general forms — interspersed in irregular veins of quartz in the mountain rocks, and in lumps and scales of all sizes down to "golden pebbles," metallic gravel, and sand, mingled with the alluvium or drift which occurs in the bottoms of the "gŭlches" or ravines, and in the banks and beds of the streams, particularly in the bars of sand and gravel formed by eddies and counter currents.

The principal streams of California are the Sacramento, San Joaquîn′, Klä′math, Trinity, Feather, Yū′ba, Eel, Nap′pa, Calavē′ras, Salî′nos, Guadalū′pe, Tuolŭm′ne, Moquelŭm′ne, Maripō′sa, Stan′islaus, Fall, and American Rivers. The bays worthy of note are San Francisco, San Pablō′, Suisson′, all entered through the Golden Gate, which together form a most capacious harbor. They afford good anchorage, and, being completely land-locked, are safe at all seasons. Humboldt and San Diê′go Harbors, and Trinidad and Monterêy′ Bays, are well protected from the ocean winds, and afford a safe anchorage. This country has some lakes, the most noted of which are the Tulä′res, Owen's, Clear, and Rhett.

The climate of the coast, particularly in the north-west part of the state, is mild during the year; but at the south it is much warmer, and in summer it is often exceedingly hot. A few miles inland the ocean breezes become tempered to mildness, and the climate is pleasant and healthy; but beyond the reach of the ocean breeze, particularly in the great valley, the summer is intensely hot. The dry season, in which little or no rain falls, lasts generally from April to November; the rainy months occur from November to May. The annual freshets of the valley of Sacramento and San Joaquîn′ occur in the winter and spring, in consequence of the melting snows of the Siĕr′ra.

San Francisco is the chief commercial port of California, situated on the eastern slope of the ridge dividing the Bay of San Francisco from the Pacific Ocean. The entrance from the ocean is through the Golden Gate, a narrow strait about a mile in width, with rocky walls on each side, and five miles in length, where it opens into the magnificent bay. The city is built on the sandy slope, descending from the hills to the waters of the bay, and spreads out in all directions. The streets are laid out with regularity, some parallel with the shore, and rising one behind another in a succession of terraces. Brick, stone, and iron are extensively employed

Gold. Rivers. Bays. Harbors. Lakes. Climate. Dry season. Rainy sea-

in the construction of buildings. The city is supplied with pure water from a lake three miles distant. Here is concentrated an immense capital employed in the purchase of gold dust, and in private banking.

San Francisco was incorporated as a city in 1847. It now contains a population of upwards of 50,000, who have come from every part of the globe. Daily lines of steamers run to Sacramento, Marysville, Stockton, San Joaquîn′ city, and other points on the rivers, and in the northern and southern mines; while ocean steamers ply from San Francisco to Panamä′, and San Juän′ del Sûl′, the port of Nicarä′gua. Vessels from the Atlantic coast, and from all parts of the world, constantly come and go. Lat. 37° 47′ 35″ N., lon. 122° 26′ 15″ W.

§ 44. OREGON TERRITORY.

This territory lies between the crest of the Rocky Mountains on the east, and the Pacific Ocean on the west; and between 42° and 46° 10′ N. latitude. It is bounded on the N. by Washington Territory, from which it is separated by the Columbia River and the 46th parallel; E. by Nebraska; S. by Utah and California; and W. by the ocean. Area, 210,000 square miles.

OREGON TERRITORY is chiefly mountainous, but it abounds in fertile valleys. It forms three sections, separated by ridges nearly parallel, and following the general direction of the coast line. Each section is distinct in its soil, productions, and climate. The Western section, from the coast to the Cascade range, has a genial climate throughout the year. The valley of the Willamĕtte′ is exceedingly fertile; the intervals and prairies forming the best of farms, and the uplands affording good pasturage and valuable timber. The Middle section, between the Cascade range and Blue Mountains, has generally a light, sandy soil, but many valleys of rich alluvial deposit. This is said to be a fine grazing region. The Eastern section, lying between the Blue Mountains and the crest of the Rocky Montains, comprising full one half of the territory, is mostly a rocky and rough country, with some few narrow valleys of great fertility.

The principal places are *Salem*, the capital, Portland, at

---

son. City of San Francisco. When incorporated, &c. — OREGON TERRITORY. Extent. Boundary. Face of the country. Western section. Middle section.

the head of navigation on the Columbia, Oregon City, and Astoria. Oregon was organized with a territorial government in 1848. The portion now forming Washington Territory was set off by an act of Congress, March, 1853.

§ 45. WASHINGTON TERRITORY.

WASHINGTON TERRITORY lies between the crest of the Rocky Mountains and the Pacific Ocean, and extends from the 46th parallel and Columbia River to 49° N. lat. Area, 113,821 square miles. It is bounded on the N. by British America; E. by Nebraska; S. by Oregon Territory; and W. by the ocean.

The country west of the Cascade Range is the only portion yet settled by a white population. It has a diversified surface, and the valleys bordering on the streams have a rich soil. Puget's Sound, Hood's Canal, and Admiralty Inlet abound with fine harbors. The Cascade Range crosses the country from the south (at the cascades on the Columbia River) to the north, rising in several peaks above the snow line, as Mount St. Helen's, Mount Rainiēr′, and Mount Baker. The climate is said to be unusually mild and even in temperature for so high a northern latitude. The country near Puget's Sound abounds with fine timber, and its waters with excellent fish.

Olympia is the capital, situated on Budd's Inlet, at the head of Puget's Sound. Other towns are Cowlitz, Pacific City, and Nisquâl′ly. The territory was separated fron Oregon in 1853.

§ 46. NEW MEXICO TERRITORY.

The TERRITORY OF NEW MEXICO is situated between 32° and 38° N. lat., and between 103° and 116° W. lon. It is bounded N. by Utah and Kansas; E. by Kansas and Texas; S. by Texas and Mexico; and W. by California. Area, about 211,000 square miles.

The general appearance of the country is mountainous, with a large valley in the middle running north and south,

---

Eastern section. Salem. Other places. — WASHINGTON TERRITORY. Extent. Boundaries. Settled portion. Surface. Harbors. The Cascade range. Peaks. Climate. Puget's Sound. Olympia. Other places. — NEW MEXICO TERRIformed by the Rî′o Grän′de del Nör′te. This valley is generally about 20 miles wide, and bordered on the east and west by mountain chains, continuations of the Rocky Mountains. There are some valleys of less extent along the borders of smaller streams, and a few spaces of elevated table land. East of the Rocky Mountains there are prairies and plains. The soil in the valley of the Rî′o Grän′de, within the limits of this territory, is generally sandy and looks poor, but by irrigation it produces abundant crops. The most fertile part of the valley begins below Sän′ta Fê, along the river, where it is not unusual to raise two crops in one year. Besides the Rî′o Grän′de, the Colorä′do forms part of the western boundary, and the Gî′la, which flows westward, is now included within the southern limits of this territory. New Mexico was obtained from the Mexican government by treaty in 1848, and was organized as a territory in 1850. *Sän′ta Fê* is the capital.

§ 47. UTAH TERRITORY.

UTAH is situated between 37° and 42° N. lat., and 106° and 120° W. lon. It is bounded on the N. by Oregon; E. by the crest of the Rocky Mountains, which separate it from Nebraska, Kansas, and New Mexico; S. by New Mexico; and W. by the Sierra Nevada range, which separate it from California. Area, 208,775 square miles. In 1853 the population was 18,206.

This is one of the most singular countries in the world. It occupies the northern portion of the great basin between the Siĕr′ra Nevä′da and the Rocky Mountains, at an elevation of from 4000 to 5000 feet above the sea level, shut in all around by mountains, with its own system of lakes and rivers, and without any direct connection with the ocean. Mountain is the predominating structure of the interior of the basin, with plains between; the mountains are wooded and watered, the plains arid and sterile. The mountains of the interior are the Hŭm′boldt and Wâ′satch. The principal rivers are the Colorä′do, Humboldt's, Bear, Utah, and Timpăn′ogos. The chief lake is the Great Salt Lake, the waters of which are shallow, and contain more salt than can be held in solution, so that its borders abound with crystallized salt, and

---

TORY. Extent and boundaries. Face of the country. Soil. Rivers. When ceded to the United States. When organized. Santa Fé. — UTAH TERRITORY. Extent and boundaries. A singular country. Location and aspects.

the bottom of the lake is incrusted with it. No living creature can exist in its waters. The lake is about 70 miles long and 35 broad, and has no known outlet. Utah Lake is of fresh water, and receives numerous fresh water streams from the mountains. It abounds in fish; is about 100 feet above the level of the Salt Lake, into which it pours its surplus waters by the River Jordan, 35 miles in length. The valleys are susceptible of cultivation where they can be irrigated. There is but little rain, except on the mountains, from March to October. The temperature is more uniform in the valley than on the Atlantic coast; it rarely falls below zero.

About the time of the opening of the late war with Mexico the Mormons were driven from Nauvoo, Illinois, by the violence of a mob. They sought a temporary refuge on the western border of Iō′wa, from whence they commenced their emigration to the Great Salt Lake, and founded the Great Salt Lake City. They organized a temporary government under the title of the State of Deseret; but the United States government established a territory by the present name of Utah, on the 9th of September, 1850, since which time the population has increased by emigration from all parts of the earth of converts to "the faith," more especially from Wales and other parts of Great Britain.

The capital is *Fillmore City,* situated on the western slope of the Wasatch Mountains, in the interior of the territory, at an elevation of 4790 feet above the level of the ocean, and in a fertile valley, whose surplus waters are carried off by a small stream into the Nicollet River and Lake. A recent traveller in this region writes as follows: —

"We examined a very rich coal bed in San Pete Valley which was recently discovered, and found it composed of three layers, of 2½, 3½, and 5 feet, one above the other, and but a thin layer of rock between each. It is clean bituminous coal, of an excellent quality, and burns freely, as we ascertained by making a fire with it on the ground. It lies in the mountains at an angle of about five or six degrees, and is very accessible and abundant.

"About thirty-five miles south of Fillmore, and one mile from the road, I visited a sulphur bed, which is evidently the crater of an extinguished volcano. The sulphur, which is very rich, forms a crust of half a mile in circumference, varies in depth, and beneath it the earth is hollow or like a

---

Predominating structure. Mountains. Rivers. Lakes. Valleys Rains. Temperature. The Mormons. Fillmore City.

honeycomb, as the footsteps of my horse plainly indicated. By placing the ear over any of the apertures in the crust, and of which there are several, the sound of cataracts is distinctly heard from a great depth. Above this bed there is a beautiful magnesia spring, and below it another of sulphur and magnesia combined.

" In Salt Creek Canon there is a mountain of rock salt of an excellent quality. Seven miles from Fillmore stands conspicuously Cinder Rock, six miles long, and composed exclusively of volcanic cinders, upon which no vegetation exists.

" I visited the iron works at Cedar City, in Iron county, and found the furnace in blast. Coal of a superior quality, and iron ore containing 75 per cent. of pure metal, are found in abundance upon the surface of the ground. They are now making castings with cold air, which will soon be superseded by hot air, as all the requisite pipes have been cast.

" Grasshoppers have been very destructive to the wheat throughout the valleys, and many farmers are reploughing their fields to plant potatoes and corn.

" Cattle raising is carried on here (in Southern Utah) very profitably, and to a great extent, as it is not necessary to feed them. The raising of sheep is also attended to, and they are increasing in number very fast.

" The progress these people have made in converting these deserts into 'smiling fields' within so short a period is astonishing to a stranger, and highly praiseworthy."

Exercises in Voyages and Travels.

Describe a voyage from New York to Rio Janeiro; from thence to Valparaiso; and from thence to San Francisco. Describe the land route from St. Louis, Mo., to Santa Fé; from Independence to Oregon; to Utah; to California. Ship a cargo of wheat from Salem on the Willamette to San Francisco. Voyage from San Francisco to the Sandwich Islands.

CHAPTER IV.

MEXICO, CENTRAL AMERICA, AND WEST INDIES.

§ 1. Mexico.

Area in square miles, 855,964. Population, 7,661,919.

Mexico is bounded on the N. E. by the Rî′o Grän′de del Nor′te, which separates it from Texas; on the E. by the Gulf of Mexico; on the S. E. by the State of Guatemala; on the W. and S. W. by the Pacific Ocean; and on the N. by the conventional boundary line, as established by the Gadsden treaty of 1854, which runs between the 31st and 32d parallels of latitude. That portion of Mexico lying south of the tropic of Cancer is best known, and is the most wealthy and populous. The surface is very varied, causing that singular diversity of climate which distinguishes it from most other countries. Mexico has long been noted for its mines of the precious metals; but recent researches have made known the existence of other valuable metals besides these — iron, copper, tin, lead, zinc, and quicksilver. The productions of the soil are Indian corn, wheat, coffee, sugar, rice, cotton, tobacco, indigo, and the tropical fruits.

“ The form of government in Mexico is a problem. Ever changing in form and principle — now based on constitutional law, and anon the sport of a dictator — it is impossible to define its numerous phases. Nominally it is a republic, and is vested in a President and Congress similar to that of the United States. The characteristics of the Mexican are deceit and falsehood, but it is deceit and falsehood engendered in an atmosphere where truth, and frankness, and honesty lead the possessor of these virtues to certain punishment. The influence of government in producing this

---

Mexico. Boundaries. Part best known. Surface. Mines. Productions. Government. Revolutions. States. City of Mexico. Chief seaports on the state of things is acknowledged; a terror constantly occupies the minds of the people, and an apprehension of coming evils and an anxiety to avoid them overcome all sense of moral uprightness, and convert the people into a nation of serfs, amenable to the nod of the taskmaster. The church, too, acts wofully on the reasoning faculties, and holds over the head of all who refuse to acknowledge its supremacy the rod of oppression."

The states comprising the Mexican confederacy are as follows: —

Tamâu′lipas,
Nuê′vo Leōn′,
Cōahuî′la,
Chihuâ′hua,
Durăn′go,
Sonö′ra,
Cinalō′a,
Sän Luîs Potō′si,
Zacatê′cas,
Guänaxuä′to,
A′guas Caliĕn′tes,
Jälĭs′cō,
Mechōacăn′,
Vê′ra Crûz,
Mexico,
Queretä′ro,
Pûê′bla,
Oäxä′ca,
Tabăs′cō,
Chiä′pas,
Yūcatăn′.

Besides the states, there are also the Territories of *Lower California*, *Tlăscala*, and *Colīma.*

The city of Mexico, the capital of the confederacy, and one of the most beautiful cities in the world, is situated in the midst of an elevated plain, 7000 feet above the level of the sea, and surrounded by mountains. Lat. 19° 25′ N., lon. 99° 5′ W. The principal seaports on the Gulf of Mexico are Vê′ra Crûz, Tampî′co, Sōto la Marî′na, and Matamō′ras; on the Pacific coast, Acapûl′co, Sän Bläs, and Măzătlăn′; and on the Gulf of California, Guaȳä′mas.

§ 2. THE CENTRAL AMERICAN STATES.

Area in square miles, 281,900. Population, 2,104,916.

The country, which, under the dominion of Spain, was known as the kingdom of Guatemä′la, is now divided into six parts: British Honduras in the north, and the five separate republics of *Guatemä′la*, *Hondu′ras*, *San Salvadōr′*, *Nicarä′gua*, and *Costa Rī′ca.* Their respective capitals are New Guatemala, Comayägua, San Salvadōr, Leon, and San José. These states have each a form of government chiefly based on the Constitution of the United States. In some the gov-

---

gulf. On the west coast. — CENTRAL AMERICAN STATES. Six divisions or states. Form of government. Cities, towns, and villages. Articles of exernments are republican in name only. The cities, towns, and villages have separate municipalities, and annually elect their alcaldes and other officers. The principal exports of these states are the precious metals, indigo, cochineal, mahogany, dye woods, sarsaparilla, hides, and tortoise shell. The trade is chiefly in the hands of the English and Americans. The principal ports on the Caribbē′an Sea are Omō′a, Truxîl′lo, and Greytown. Those on the Pacific are Realejō′, Cäl′deras, La Union, Libertad, and Istä′pa.

§ 3. The West Indies.

Area in square miles, 94,585. Population, 3,673,857.

The original races of these islands are now extinct. When first discovered by the Spaniards, in 1492, they were inhabited by two distinct nations; those occupying the Bahā′mas and Greater Antîlles′ were a mild, peaceful, and numerous people, and somewhat advanced in civilization; those of the Caribbee Islands were fierce and warlike. At a later period many of these islands have, at different times, belonged to different European nations, and in some of them there is a strange mixture of people and languages. All, except San Domingo, still belong to European powers, and, excepting the English colonies, contain a large proportion of negro slaves. The whites form, comparatively, but a small part of the population.

The Bahamas consist of about 650 islands and keys. They belong to Great Britain, and have a population of about 27,000. *Nassau*, the capital, is a flourishing town, on Providence Island. The salt ponds of Turk's Island supply great quantities of salt, the chief article of export.

Cuba, the chief of the Greater Antîlles′, is the largest and most important of the West Indies. It comprises an area of 43,380 square miles, and a population of 1,247,230. It is governed by a captain general appointed by Spain. *Havana*, the capital, on the N. W. coast, is one of the chief cities of America. It has one of the best harbors in the world, and an extensive commerce. The other principal places are Matanzas, Puerto Prin′cipe, San Salvadōr′, and St. Jā′go. The chief exports are tobacco, coffee, sugar, and fruits.

---

port. Ports on the Caribbean Sea. On the Pacific. — West Indies. Of the aborigines. Two nations in the time of Columbus. At a later period. Controlling power. Negroes. — Bahamas. Nassau. Turk's Island. — Cuba. Ha-

Porto Rico, the most easterly of the Greater Antîlles′, also belongs to Spain. Its rich and varied soil is adapted to the cultivation of sugar cane, coffee, rice, and cocoa. *San Juan*, the capital, has considerable commerce. Area of the island, 3865 square miles. Population, 380,000.

San Domingo Island is in possession of the negroes, and is divided into two independent states. The Empire of Hayti is in the west, with an area of 11,500 square miles, and 700,000 inhabitants. *Port au Prince*, on the Gulf of Gonäve′, is the capital, and most important place on the island. The Republic of Dominica is in the east, and comprises an area of 18,000 square miles, with a population of 200,000. Its capital is *San Domingo.*

Jamaica is the principal of the British West India Islands. It lies about 100 miles south of Cuba, and comprises an area of 4250 square miles, and a population of 379,690, of whom about 16,000 are whites. *Spanishtown* is the capital, and *Kingston* the chief port.

Of the smaller English islands, Trinidad, a fertile and beautiful island, is near the coast of Venezuela; also Tobä′go, Grenä′da, Barbā′does, and St. Christopher's. French islands are Martinîque′ and Guadalôupe′. Danish, Säntа Crûz and St. Thomas. Dutch, Curaçō′a and St. Eustā′tia. Swedish, St. Bartholomew.

Exercises in Voyages and Travels.

Describe the Panama route from Boston to San Francisco. The Nicaragua route from New York. The Tehuantepec route from Philadelphia. Travel from Vera Cruz to Mexico. From Mexico to Santa Fé. How would you convey a cargo of mahogany and sarsaparilla from Omoa to Providence, R. I.? A voyage from Salem, Mass., to Truxillo, Hond., and thence to Havana and Baltimore.

---

vana. Other towns. Exports. — Porto Rico. San Juan. — San Domingo. Two states. Hayti. Capital. Dominica. Capital. — Jamaica. Chief towns. English islands. French. Danish. Dutch. Swedish.

CHAPTER V.

POLITICAL DIVISIONS OF SOUTH AMERICA.

§ 1. INHABITANTS AND COUNTRIES.

IN comparison with the extent and fertility of South America, the population is small, consisting of the aborigines, or native Indians, the whites, the African Negroes, with Mestizoes, Mulattoes, and Samboes. The whites are chiefly of Spanish and Portuguese origin. In Guiana there are a few English, Dutch, and French. South America is politically divided into a number of states, as follows: The republics of Venezuē′la, New Grenä′da, Ecuadōr′, Peru̍′, Bolîv′ia, Chî′le, Lä Plä′ta, Uruguaȳ′, and Paraguaȳ′; the empire of Brazîl′; the colonies of British, Dutch, and French Guiä′na; and the unsettled country of Patagō′nia.

§ 2. VENEZUELA.

Area, 426,712 square miles. Population, 1,356,000.

VENEZUELA is a republic, and is remarkable for its extensive plains and its rich vegetable productions. The northern part is traversed by a range of the Andes, and its southern portion by the Parî′ma group of mountains and plateaus; while its middle portion forms the basin of the River Orinoco. The chief exports are cacao, coffee, tobacco, indigo, cotton, sarsaparilla, and dyewoods.

Caraccas, the capital, is near the northern coast, on a declivity 2280 feet in elevation. It is memorable for the great earthquake of 1812, which destroyed 12,000 of its inhabitants. Lä Guaȳ′ra, 16 miles distant, on the coast of the Caribbē′an

---

SOUTH AMERICA. Population. Whites. Political divisions.—VENEZUELA. Physical aspects. Caraccas. La Guayra. Other towns. — NEW GRENADA.

Sea, is its seaport. Other important towns, Valen′cia, Cō′ro, Truxîl′lo, Mĕr′ida, Cumanä′, and Angostŭ′ra.

§ 3. New Grenada.

Area, 394,664 square miles. Population, 2,243,054.

This state occupies the north-west part of South America, and includes the Isthmus of Panamä′. It consists of elevated table lands extending northward from the Knot of Pas′to, on the southern frontier, to the sea coast. The soil is fertile, producing cotton, grain, coffee, cocoa, tobacco, and indigo; and the mines yield gold, silver, plăt′ina, emeralds, copper, lead, and salt. The Isthmus of Panamä′ forms one of the departments of the state, and contains the towns of Panamä′, Chä′grĕs, Por′to Bel′lo, and Verä′gua.

Bogotä′, the capital, is in the interior, on a beautiful, fertile plain, 8730 feet above the sea level. Carthagē′na, San′ta Mar′tha, and Hŏn′da are situated on the northern coast; Pōpayan′ and Pasto in the south.

§ 4. Ecuador.

Area, 325,000 square miles. Population, 665,000.

Ecuador is a republic, and resembles New Grenä′da in climate, soil, and productions; and contains some of the remarkable summits of the Andes — Chimborä′zo, Pichĭn′-cha, Cotopăx′i, and Antisä′na.

Quî′to, the capital, is situated under the equator, on an elevated plateau, 9543 feet above the level of the sea. The city is well built and handsome; the churches are splendid; it possesses all the comforts and luxuries of civilized life, in a situation of unrivalled grandeur and beauty. Guaȳaquîl′, on the Pacific, is distinguished for its excellent harbor and extensive commerce. Riobăm′ba, Lō′ja, and Jaên′ are among the other important towns.

Situation. Aspects. Soil. Productions. Minerals. Isthmus of Panama. Towns. Bogota. Other cities. — Ecuador. Summits of the Andes within

§ 5. Peru.

Area, 520,000 square miles. Population, 2,127,662.

Peru is noted for the variety of its climate and productions, and its mines of the precious metals.

Lî'ma, the capital, is situated on the Rî'mac, in a delightful valley, 7 miles from the seaport of Callaō', on the Pacific. Cûz'co, about 250 miles from the ocean, was the capital of the ancient empire of the Incas. It was regarded by the natives as a sacred city, and contained the celebrated temple of the sun. It was originally connected with Quî'to by two immense causeways 1500 miles in length. Arequî'pa, Arî'ca, and Paȳ'ta are considerable towns on the coast.

§ 6. Bolivia.

Area, 374,480 square miles. Population, 1,700,000.

Bolivia was once a part of Peru. Though mining is extensively carried on, the chief pursuit of the people is agriculture. The western part of Bolîv'ia is traversed by the ranges of the Andes, in which are some of the loftiest summits; while in the eastern part are the extensive plains of Mō'jos and Chiquî'tos. Between the Andes and the Pacific is the Desert of Atacä'ma.

Chuquisä'ca, the capital, is situated on a plain, in the central part of the state. La Päz, north-west of the capital, is the chief commercial city of Bolivia; it is elevated 12,150 feet above the sea level. Poto'si, formerly a large and opulent city, celebrated for its rich silver mines, is situated at the height of 13,330 feet above the sea, on the western declivity of the Cer'ro-de-Poto'si. This mountain seems to consist entirely of silver ore, of different degrees of richness. Cobî'ja is a little village in the Desert of Atacä'ma, and deserves notice as being the only seaport of the republic.

---

it. Quito. Guayaquil. Other towns. — Peru. Lima. Cuzco. Other towns. — Bolivia. Aspects. Desert. Chuquisaca. La Paz. Potosi. Cobija. —

§ 7. CHILE.

Area, 171,244 square miles. Population, 1,600,000.

CHILE is the best governed and most prosperous state in South America, and consists of a long, narrow territory, extending 1200 miles along the Pacific coast. It presents a plain, gradually rising in elevation as it recedes from the coast and approaches the Andes. The maritime part is intersected by three ridges, running parallel with the Andes; the midland part is generally level, of great fertility, and a delightful climate. This state is the most thickly-settled portion of South America. Agriculture is the leading pursuit; the commerce is large and increasing; and the mining of copper and silver is extensive.

Santiä′go, the capital, is on a plain, about 90 miles from the sea. It is connected by a railroad with Valparāi′so, the chief seaport of Chī′le, which stands on the Pacific, and has a fine harbor. Coquīm′bo, Copiä′po, Concĕp′cion, and Valdĭv′ia are among the other important places.

§ 8. THE ARGENTINE REPUBLIC.

Area, 726,000 square miles. Population, 829,400.

This is an entensive country, distinguished for its immense plains, called pampas, on which vast herds of wild horses and cattle roam at large. The confederation consists of thirteen states and the territory of Grand Chaco, of which the city of *Buēnōs Aȳ′res* is the capital, situated on the south bank of the Rī′ō de lä Plä′ta. It is one of the principal cities of South America, and distinguished both for its literary and commercial activity. Cŏrriĕn′tes, Cordō′va, Sän Juän′, and Mendō′za are other principal towns.

CHILE. Maritime part. Midland part. Comparison. Agriculture. Mining. Santiago. Valparaiso. Other towns. — BUENOS AYRES. States. City of

§ 9. URUGUAY, OR BANDA ORIENTAL.

Area, 120,000 square miles. Population, 250,000.

URUGUAY is a small state, lying between the Atlantic ocean and the La Plä′ta and Urŭguaȳ′ Rivers. It has a fertile soil, healthful climate, and a favorable situation for commerce. *Mon′tevīdeo*, the capital, is on the north bank of the Rî′ō de lä Plä′ta, near its mouth.

§ 10. PARAGUAY.

Area, 84,000 square miles. Population, 260,000.

PARAGUAY is a small inland state, lying between the Paranä′ and Paraguaȳ′ Rivers. Its surface is level, soil fertile, and climate healthy. Its most noted production is măt′te, called Paraguay tea. The chief towns are *Asunciōn′*, the capital, Vîl′la Rî′ca, and Vîl′la Reäl′.

§ 11. EMPIRE OF BRAZIL.

Area, 3,956,000 square miles. Population, 6,065,000

BRAZIL occupies about one third of the South American continent, and is one of the richest countries in the world in vegetable and mineral productions. The climate, for the most part, is mild and genial; the soil rich; and the surface diversified with mountains and valleys, hills and plains. It is politically divided into nineteen provinces. The white inhabitants are principally Portuguese, or of Portuguese origin. Much of the country has never been explored, and is occupied by savage tribes of independent Indians.

Rî′ō Janēi′rō is the capital and chief city of the empire It is situated on a bay of the Atlantic, which forms one of the best harbors in the world. Bähîa, or Sän Salvadōr′, on the strait leading to the Bay of All Saints, is the rival of the capital in commerce. Pernambŭ′co, Natäl′, Maranhăm′, Parä′, are all important places.

Buenos Ayres. Other towns. — URUGUAY. Montevideo. — PARAGUAY. Tea. Chief towns. — BRAZIL. Climate. Soil. Surface. Divisions. White

§ 12. GUIANA.

Area, 162,560 square miles. Population, 213,975.

GUIANA comprises three colonies, severally belonging to Great Britain, Holland, and France.

DEMERARA, or British Guiana, is the western portion, and includes the three colonies of Demerä′ra, Bërbîce′, and Essequî′bō. The chief towns are Georgetown, the capital, and New Amsterdam.

SURINAM, or Dutch Guiana, is the middle portion, and consists of unhealthy marshes, drained by canals. Păramăr′ibō, the capital, is on the Surin′ăm River. It has a good harbor and extensive commerce.

CAYENNE, or French Guiana, is the eastern portion. It is divided into two districts — Cay̅enne′ and Sinnamäri. Cay̅enné, on the island of that name, is the capital.

§ 13. PATAGONIA.

Area, 80,000 square miles. Population, 20,000.

This territory, comprising the southern point of the continent, is wholly occupied by Indians, who are in a savage state, and of remarkably large stature.

EXERCISES IN VOYAGES AND TRAVELS.

Describe a voyage from New York to Rio Janeiro. Thence to Buenos Ayres. From La Guayra to Panama by sea and land. The same as a sea voyage. Voyage from Cayenne to Asuncion. From Valparaiso to Callao, touching at the intermediate ports. From Carthagena to Boston. A cargo of coffee from Rio Janeiro to Providence. Describe the overland route from Buenos Ayres to Valparaiso. Ship a cargo of hides and horns at Montevideo, and select a market in the United States.

---

population. Indians. Rio Janeiro. Bahia. Other towns. — GUIANA. Colonies. Demerara. Surinam. Cayenne. — PATAGONIA.

CHAPTER VI.

POLITICAL DIVISIONS OF EUROPE.

§ 1. INHABITANTS AND COUNTRIES.

EUROPE surpasses all other continents in wealth, intelligence, and general civilization. It is characterized by the irregularities of its shape and surface, and its numerous inland seas, gulfs, peninsulas, and headlands. The inhabitants of Europe include many varieties, but the prevailing races are the Teŭtŏn′ic, Cĕl′tic, and Slavō′nian. In the greater part of the continent these races are mixed, but the blood is *purely* Teŭtŏn′ic throughout Iceland, Scandinā′via, round the Gulf of Bŏth′nia, in Denmark, Germany, and the east of England, from Portsmouth to the Tyne. The pure Cĕl′tic is confined to the north and north-west of Spain, the south and south-west of France, a part of the Grîsōns′ and Switzerland, and some part of Great Britain and Ireland. The Slavō′nian is widely dispersed in Middle Rŭssia. These three races have been much improved, by mixture, in appearance, energy, and versatility of mind. At present the Teŭtŏn′ic race, including the inhabitants of North America and the British colonies, considerably outnumber the Cĕl′tic, though its numbers were far inferior in ancient times. The Teŭtŏn′ic variety has subdued, and even exterminated the other varieties in its progress towards the west. It is undoubtedly the most vigorous, both in body and mind, and seems destined to conquer and civilize the whole world. It is a singular fact, whatever the cause may be, that the Celts are invariably Roman Catholic, while the Teŭtŏn′ic population is inclined to Protestantism. Various other races inhabit Europe, as the Turks, Finns, the Sămŏĭēdes′, who live on the shores of the White Sea and in the north-east of Rŭssia,

---

EUROPE. Its points of excellence. Characteristics. Prevailing races. Teutonic countries. Celtic countries. Slavonic countries. Comparative numbers of the Teutonic and Celtic races. Superiority of the Teutonic race.

and the Hungarians. There are many mixed Tartar tribes, chiefly in the south and east of Rŭssia; also Jews and Gypsies, who live among all nations, yet mix with none.

The governments of Europe are chiefly monarchical; and in almost every European state we find the citizens divided into four distinct classes. The first is that of the nobility, which exists in most states, with the exception of Norway, Switzerland, and the Turkish empire. The second class is formed of the clergy. The third class is composed of the citizens, or inhabitants of towns; these enjoy peculiar rights and privileges in most countries. The fourth class includes the peasants, and forms the mass of the population.

Europe may be divided into three sections, as follows: *Central*, comprising Great Britain, Netherlands, Belgium, France, Switzerland, Austria, Prussia, and Germany; *Southern*, comprising Spain, Portugal, Italy, Turkey, and Greece; and *Northern*, comprising Russia, Sweden, Norway, and Denmark.

§ 2. GREAT BRITAIN AND IRELAND.

Area, 122,550 square miles. Population, 27,675,324.

This is the richest and most powerful kingdom in the world. The head of the government is in the British Isles, which lie west of Europe, and comprise England, Wales, Scotland, and Ireland. These, with its possessions in every quarter of the globe, constitute the British empire. It is one of the "Five Great Powers" which control the political destinies of Europe. In the extent, variety, and perfection of its manufactures, in its commerce, and in its navy, Great Britain surpasses all other nations. The form of government is that of a limited hereditary monarchy, and the supreme power is vested in a king, or queen, and parliament. The parliament consists of two branches, viz., the House of Lords and the House of Commons. The House of Lords is composed of bishops, and hereditary peers of five different ranks, viz., dukes, marquises, earls, viscounts, and barons. The House of Commons is composed of representatives elected by the people. The Episcopal form of church government, of which the sovereign is the head, is the state-established religion in England and Ireland, and the Presby-

---

Their respective religions. Various other races. Governments in Europe. Four classes of people. The nobility. Clergy. Citizens. Peasantry. States.—GREAT BRITAIN. Comparison. Extent. The "Five Great Powers" of Europe.

terian form, that of Scotland. There is, however, the most complete toleration of all other religious sects throughout the empire. The most perfect degree of personal freedom is guarantied in Britain by the Habeas Corpus act, — which secures to the suspected prisoner a trial or liberation within a limited time, — the trial by jury, the liberty of the press, liberty of conscience, the right of franchise, and the total abolition of slavery. Each city and municipal borough has the election of its own separate corporate officers. The colonies have each a governor appointed by the crown.

ENGLAND is the largest and most important part of the Island of Great Britain, and is renowned for its splendid cities, its high cultivation, its numerous railways and canals, and its universities.

London, the capital of the kingdom, is the greatest city in Europe. It excels all other cities in wealth, commerce, literature, science, arts, and charitable institutions. It is situated on both sides of the River Thames, 45 miles from the sea. Among the many splendid edifices in London are the Parliament Houses, Westminster Abbey, and St. Paul's Cathedral.

Liverpool, on the Mersey, near its mouth, is, next to London, the greatest commercial emporium, and the principal place of trade with the United States.

Portsmouth is the great rendezvous of the British navy. Manchester is famed for its cotton manufactures; Birmingham, for its hardware; Sheffield, for its cutlery; Leeds, for its woollen cloths; Newcastle, for its coal mines; Oxford and Cambridge, for their universities; Bath, Bristol, and Cheltenham, as watering-places; and Dover, as being the town nearest to France. The electric telegraph crosses the Straits of Dover from this place to Călāis′. A mail route from London to Alexandria passes through France to Marseilles. A line of steamers runs from Southampton to Alexandria direct.

WALES is a rugged, mountainous peninsula on the west of England, abounding in iron, lead, copper, and coal. Swansea, Newport, Cardiff, and Caernar′von are its principal ports. Holyhead is the chief packet station for communication with Ireland.

SCOTLAND occupies the northern part of the Island of Great

Points of excellence. Government. Parliament. — ENGLAND. London. Public edifices. Liverpool. Portsmouth. Manchester. Birmingham. Sheffield. Leeds. Newcastle. Oxford and Cambridge. Bath, Bristol, and Cheltenham. Dover. — WALES. Chief towns. — SCOTLAND. Edinburgh. Glas-

Britain, and is noted for its wild mountain scenery, and its beautiful lakes. The Grampian Hills divide it into two parts — the Highlands in the north, and the Lowlands in the south. The Lowland Scotch are distinguished for intelligence, morality, and religious feeling. The Highlanders are of Celtic origin.

Edinburgh, the capital, is the chief seat of the law courts of Scotland, and has long been noted for its learned societies and its university. Glasgow, Paisley, and Perth are celebrated for their manufactures; Melrose, for the ruins of its ancient abbey; Aberdeen, for its university; and Dundee for its linen manufactures.

IRELAND is an island, celebrated for its verdure, and hence it is called the "Emerald Isle." The surface is generally level, with swelling hills and a few mountains of moderate height. The bogs furnish ample supplies of peat for fuel. Potatoes and oats furnish the chief food of the inhabitants; but beef, butter, pork, mutton, and other provisions are produced in great quantities for the English markets. Linen is the chief article of manufacture.

Dublin is the chief city of Ireland, situated at the head of a beautiful bay. It is one of the finest cities in the United Kingdom; its university is one of the most richly endowed in Europe. Cork, in the south of Ireland, is the second city in importance. Belfast, Londonderry, Galway, and Limerick are also places of note.

§ 3. THE NETHERLANDS.

Area, 639,915 square miles. Population, 3,362,625.

The KINGDOM OF THE NETHERLANDS, or HOLLAND, is a low, level country, some parts even lying below the level of the sea, and protected from inundation by immense dikes, or embankments of earth. Canals are almost as common as roads, and serve the same purpose. The soil is highly cultivated; the meadows and pastures are rich and productive. Butter and cheese of superior quality are articles of extensive commerce; wheat, flax, and madder are raised in the northern parts. The Dutch are distinguished for frugality, neatness, and industry. Freedom in religious worship is

---

gow, &c. — IRELAND. Productions. Dublin. Cork. Other towns. — HOLLAND. Face of the country. Soil. Products. Of the Dutch people. The allowed to all. Their system of education is excellent. The government is a constitutional monarchy.

The Hague, the capital, is situated near the coast, and communicates with all the principal places of the kingdom by means of canals. *Amsterdam* is the largest, richest, and most populous city. It was once the first commercial city in Europe. It is situated between Zuȳ′der-Zee and Haarlem Lake, and is noted for its vast ship yards, its state house, which is built on 13,000 piles, and for its canals, which divide it into nearly a hundred islands. Rotterdam, on the Meuse, is next in commercial importance.

§ 4. BELGIUM.

Area, 11,313 square miles. Population, 4,459,090.

The KINGDOM OF BELGIUM is the most densely populated country in Europe. The surface is level, and the soil rich and highly cultivated. The people are industrious and skilful in manufactures. The western provinces are chiefly devoted to maritime pursuits; in the central, manufactures are mostly prosecuted; while in the south, agriculture is the chief occupation. Belgium is Roman Catholic by law. The clergy are numerous and influential; the people are ignorant and superstitious. The government is a constitutional monarchy.

Brŭs′sels, the capital, on a branch of the Sc̱hĕldt, is one of the finest cities in Europe, and is noted for its laces and carpets. Waterloo, 10 miles south of Brŭs′sels, is the memorable battle field where Napoleon Bonaparte was defeated by the allied armies in 1815. Antwerp is an important seaport on the Sc̱hĕldt. Ghent is the ancient capital of Flanders. The manufacture of cotton goods has, of late, become a flourishing branch of industry.

Hague. Amsterdam. Rotterdam. — BELGIUM. Surface. Soil. People. Occupations of the west, central, and southern portions. Religion. Government. Brussels. Waterloo. Antwerp. Ghent. — FRANCE. Government.

§ 5. FRANCE.

Area, 203,736 square miles. Population, 35,781,628.

FRANCE is at present an empire, and one of the largest and most powerful nations of Europe. In literature, science, and the arts the French hold a high rank among the enlightened nations of the earth. They excel in the beauty of their manufactures; silks, linens, woollens, wines, and brandy form the chief articles of export.

Paris, the capital, on the Seine River, is the gayest city in Europe, abounding in magnificent edifices, palaces, promenades, public gardens, fountains, and places of amusement. Lyons, the second city of France as regards population, wealth, and commerce, is situated on the Rhone. It is the greatest manufacturing town in France, being noted for its silk goods and gold and silver stuffs.

Marseilles is a large seaport on the Gulf of Lyons. Bordeaux is famous for its wines. Brest, on the Atlantic coast, and Toulon, on the Mediterranean, are the chief naval stations. Rouen is the great centre of cotton manufactures. Versailles is the seat of a magnificent palace. Havre is the seaport of Paris, at the mouth of the Seine. Rochelle is a great commercial city on the Atlantic coast. Calais is a fortified seaport town of France, on the Strait of Dover, and is noted as being the nearest port to England. It has daily steam communication with Dover, which is 26 miles distant. There is also a submarine telegraph connecting the two places.

The *Island of Corsica* belongs to France. *Ajaccio,* (A-yat′-cho,) the chief town, is noted as the birthplace of Napoleon Bonaparte.

§ 6. SWITZERLAND.

Area, 25,261 square miles. Population, 2,390,116.

SWITZERLAND is noted for the grandeur of its natural scenery and the freedom of its political institutions. It is situated in Central Europe, between 45° 50′ and 47° 50′ N. lat., and 5° 55′ and 10° 30′ E. lon.; length 216 miles, breadth 75 to 140 miles. It belongs to the region of the Central

---

Points of excellence. Manufactures. Paris. Lyons. Marseilles. Bordeaux. Brest and Toulon. Rouen. Versailles. Havre. Rochelle. Corsica. — SWIT-

Alps, extending between Mont Blanc, in Savoy, and the Gross Glockner, in the Tyrol. The immense mass of Mount St. Gothard forms the centre of a system of mountains covered with perpetual snow and glaciers. The Alps cover all the central, southern, and south-eastern portion of the country, and occupy more than one half its surface. The Jura mountains extend along the N. W. borders, and between these is an undulating table land, 135 miles in length, from the Lake of Geneva, in the S. W., to the Lake of Constance, in the N. E. Its extreme breadth is 50 miles. Next the Alps it is 2000 feet above the sea, sloping towards the Jura, where it is 1350 feet.

The high Alps form vast reservoirs, whence issue thousands of fertilizing torrents. The chief rivers flow by the Rhine to the North Sea, by the Rhone to the Mediterranean, by the Ticino to the Po and Adriatic, and by the Inn to the Danube and Black Sea. No country in Europe, except Scandinavia, has so many lakes in proportion to its extent. The climate of Switzerland, owing to its elevation and other causes, is much more severe than might be expected from its midway position between the equator and the north pole. It presents the greatest extremes and the most violent contrasts. Vegetation corresponds with the extremes of climate. In the Valais, the fig and grape ripen at the foot of the ice-clad mountains, while near their summits the rhododendron and the lichen grow at the limit of the snow line. The great wealth of Switzerland consists in its rich and excellent pastures, which in summer support vast numbers of cattle.

Switzerland is a confederated republic, composed of 22 cantons, united in a perpetual league. By the new constitution of 1848, the federal assembly is composed of two divisions, a national council and a senate, and *Berne* was chosen as the capital or federal city. *Geneva* is the most celebrated city of Switzerland; it is chiefly distinguished as a seat of learning.

§ 7. AUSTRIA.

Area, 257,830 square miles. Population, 37,383,456.

The EMPIRE OF AUSTRIA is one of the largest, most populous, and powerful countries in Europe. It is composed of several nations, embracing almost every grade of civilization, and is one of the "Five Great Powers." It includes every variety of surface and soil; its forests are vast in extent, and it is one of the richest mineral countries in Europe. The provinces of Austria Proper, Tyrol, and Styria are German; Illyria, Bohemia, Moravia, Silesia, Dalmatia, Transylvania, and the military frontier are Slavonian; Hungary, with Slavonia and Croatia, are Magyar; Galicia and Bukovina are Polish; and Venetian Lombardy is Italian.

Vienna, the capital of the empire, is situated on the right bank of the Danube. It is one of the most splendid cities of Europe. Among other important places in Austria are Prague, Brünn, Olmütz, Presburg, Büda, Pesth, Triĕste′, Grätz, Zära, Venice, and Mĭl′an.

§ 8. PRUSSIA.

Area, 107,300 square miles. Population, 16,346,625.

The KINGDOM OF PRUSSIA comprises two distinct territories — one portion bordering on Russia, the other traversed by the River Rhine. Between these are several small German states. This monarchy has been built up in modern times, by conquest and diplomacy, and is now one of the "Five Great Powers" that control the political destinies of Europe. The surface is generally level, consisting chiefly of extensive plains. The products of the country are grain, cattle, iron, coal, salt, and amber. The manufactures are woollens, linens, silk and cotton goods, porcelain, and hardware.

Berlin is the capital, situated on the Spree. It is a magnificent city, and celebrated as the seat of literature, science, and the arts. Dantzic, near the Baltic, has an extensive commerce and great wealth. Among other important places are Rugen, Stettîn, and Konigsberg, on the Baltic; Coblentz, Cologne, and Düs′seldorf, on the Rhine.

---

description. The German provinces. Slavonian. Magyar. Polish. Italian Vienna. Other important towns. — PRUSSIA. Divisions. This monarchy, how formed. Surface. Products. Berlin. Dantzic. Other seaports. Towns

§ 9. GERMANY.

Area, 244,634 square miles. Population, 30,164,392.

GERMANY, a country of Central Europe, is situated between 44° 48′ and 54° 50′ N. lat., and 6° and 20° E. lon.; within these limits it comprises all the countries belonging to the Germanic Confederation, consisting of thirty-eight sovereignties, (including four free cities.) It is bounded N. by the North Sea, Denmark, and the Baltic; E. by Poland, Galicia, Hungary, and Croatia; S. by Istria, the Adriatic, Italy, and Switzerland; and W. by France, Belgium, and the Netherlands. This alliance of states was formed to secure the integrity of their laws and their respective territories, and to maintain the peace and order of the whole. The confederation is represented by an assembly, called the Diet, composed of deputies from the different states, the seat of which is at *Frankfort on the Main.* The Emperor of Austria presides over the assembly.

Germany, in its reliefs, is divided naturally into three regions — the upper or southern region, the middle or the region of plateau, and the lower or northern region. The climate is in general temperate and healthful; it varies greatly in different quarters. Grain is the staple production of the north, and the vine is extensively cultivated in the south. Fine cattle and sheep are abundant. Germany is rich in minerals. Agriculture is skilfully conducted, manufactures are numerous, and commerce is extensive.

The Germans are distinguished for their industry and perseverance. General education in Germany is of a higher order than in any other country of Europe; in many of the states the common schools are excellent, especially in Saxony and Thuringia. There are many universities, and numerous gymnasiums, lyceums, academies, learned societies, and richly furnished public libraries in the different states.

The cities of Germany are very numerous, and many of them splendid. *Frankfort* is a famous commercial city, situated on both sides of the River Main, and is noted as being the seat of the German Diet. *Munich,* the capital of Bavaria, is celebrated for its museums of paintings and ancient

---

on the Rhine. — GERMANY. Its limits. What countries does it embrace? Boundaries. Objects of the union. Diet. Capital. Face of the country. Climate. Productions of the north and south. Of industrial pursuits. The German people. Education, &c. Of cities. Frankfort. Munich. Aix-la-Cha-sculpture, and is rich in choice works of art. *Aix-la-Chapĕlle′*, a frontier city of Rhenish Prussia, is remarkable for its mineral hot baths, and as having been the favorite residence of the Emperor Charlemagne. *Hamburg*, on the Elbe, is the principal commercial city of Germany. Its trade embraces every article bought or sold in Germany; it is visited by the ships of almost all nations. *Leipsic*, in Saxony, is the grand emporium of the book trade in Germany. At its Easter fair about six hundred booksellers assemble to settle their annual accounts, and the new-year and Michaelmas fairs are attended by a vast concourse of people from most countries of Europe and Western Asia.

The German States.

I. Austria.
Prussia.
Bavaria.
Saxony.
Hanover.
Wurtemberg.
II. Baden.
Hesse-Cassel.
Hesse-Darmstadt.
Holstein and Lauenburg.
Luxemburg.
III. Brunswick.
Mecklenburg-Schwerin.
Nassau.
IV. Saxe-Weimar.
Saxe-Coburg.
Saxe-Meiningen.
Saxe-Hildburghausen.
Mecklenburg-Strelitz.
Holstein-Oldenburg.
Anhalt-Dessau.
Anhalt-Bernburg.
Anhalt-Cœthen.
Schwarzburg-Sondershausen.
Schwarzburg-Rudolstadt.
Hohenzollern-Hechingen.
Hohenzollern-Sigmaringen.
Lichtenstein.
Waldeck.
Reuss-Greitz.
Reuss-Schleitz.
Lippe-Schauenburg.
Lippe-Detmold.
Hesse-Homburg.
Lubeck.
Frankfort.
Bremen.
Hamburg.

§ 10. Spain.

Area, 176,670 square miles. Population, 14,223,219.

Spain was once the most powerful kingdom in Europe, but is now one of the feeblest. Agriculture, manufactures, and commerce languish under the oppressive exactions of a corrupt government. Spain is naturally the most fruitful country of Europe, being blessed with a fertile soil and delightful climate.

Madrĭd′, the capital, on the Mănzanä′res, a tributary of the Tagus, is situated on a plateau, 2000 feet above the sea. It is a dull, but superb city, the royal palace occupying, with its gardens, a space of nearly eighty acres. *Că′dĭz*, on the island of Leōn′, on the S. W. coast, is the chief commercial

---

pelle. Hamburg. Leipsic. Table of states.—Spain. Effects of the government on industry. Madrid. Cadiz. Seville. San Sebastian. Ferrol. Barcecity of Spain, and has one of the strongest fortresses. Sĕv'îlle, once the residence of the Moorish kings, is situated on the Guädalquĭv'ir. It is the port from which Magĕl'lan sailed on his voyage of circumnavigation, in 1519. Sän Sebăs'tian is one of the finest towns in Spain, and a place of much trade, on the Bay of Biscay.

Ferrōl', in the N. W. of Spain, is one of the three great naval stations, with a fine natural harbor, defended by formidable batteries. Barcelō'na, on the Mediterranean, is a fine city, and has considerable trade. Valen'cia, on the Guädalquĭ'vir, is one of the most industrious towns in Spain. Măl'aga, so famous for its grapes, wines, almonds, and other fruits, is a fortified city on the southern coast.

Gibrâl'tar, on a spacious bay at the southern extremity of Spain, belongs to Great Britain, and is the strongest and most remarkable fortress in the world. It is a rock, forming a promontory, 3 miles long from N. to S., and from 1200 to 1400 feet in height, and almost surrounded by the waters of the Mediterranean.

§ 11. PORTUGAL.

Area, 34,500 square miles. Population, 3,412,500.

PORTUGAL was once the first commercial kingdom in Europe. The Portuguese navigators first opened to Europe the route to India, by the way of the Cape of Good Hope. Portugal is now one of the weakest states. Agriculture, manufactures, and the arts are neglected; and education is in a backward condition.

Lisbon, the capital, on the Tagus, is finely situated for trade, and has a safe and commodious harbor. Opōr'to, on the Dôu'ro, is the second city, both in industry and commerce. The principal trade is in wines, both white and red.

§ 12. ITALY.

Area, 100,439 square miles. Population, 19,365,032.

ITALY is one of the most interesting countries in the world. It was once the seat of the Roman empire. At the present time, it comprises the kingdom of Naples, or the Two

---

lona. Valencia. Malaga. Gibraltar. — PORTUGAL. The Portuguese. Present condition. Lisbon. Oporto. — ITALY. States now included. Physical aspects.

Sicilies, the States of the Church, the republic of Sän Marî'no, the grand duchy of Tuscany and Luc'ca, the duchies of Mō'dena and Par'ma, the kingdom of Lom'bardy and Ven'ice, the kingdom of Sardî'nia, and the principality of Mŏn'aco. Italy has the loftiest mountains, the most beautiful plains, the richest soil, and the finest climate in Europe, and is unrivalled for the beauty and diversity of its scenery. In music, painting, sculpture, and architecture, the Italians excel all other nations. Agriculture languishes under the oppressive laws and customs to which the people are subjected.

The Kingdom of Naples embraces the southern part of Italy, and the fine Island of Sicily.

Naples, the capital of the kingdom, and the largest city in Italy, is noted for its swarms of beggars, its warm climate, and the beauty of the surrounding country. Mount Vesuvius, and the ruins of Herculä'neum and Pompêi'i are in its vicinity.

The *Island of Sicily* is the largest, finest, and most beautiful island in the Mediterranean, producing in abundance sugar, wheat, grapes, oranges, dates, &c. Here is the celebrated volcano Mount Etna. Paler'mo, Messî'na, Catä'nia, and Sўracuse are the chief cities.

The Popedom, sometimes called the States of the Church, occupies the centre of Italy, and is governed by the pope.

Rome, on the Tiber, anciently the capital of the Roman empire, and now the capital of the Papal States, is among the most celebrated spots on the face of the earth. It is noted for its temples, palaces, and monuments of splendid architecture, and interesting on account of its majestic ruins. Here is St. Peter's Church, the noblest of cathedrals; the Vătican, or pope's palace; the Cŏlossē'um, or ruins of the great amphitheatre.

San Marino is a small republic, under the protection of the pope.

Tuscany is the most flourishing and best governed portion of Italy; it is a grand duchy. *Florence*, on the Ar'no, is the capital, and one of the finest cities in Europe; it is noted for its paintings and sculpture. Leghorn, on the Mediterranean, is the first commercial city in Italy.

Parma, Modena, and Lucca are small states, called duchies, lying next north of Tuscany.

Fine arts. Effects of government on industry. Naples. Capital. Sicily. Volcano. Towns. The Popedom. Rome. For what noted. San Marino.

Sardinia embraces the N. W. portion of Italy and the Island of Sardinia. *Turin,* the capital, on the River Po, is one of the most regularly built towns in Europe, and it takes a high rank for its literary and scientific institutions. Gĕn′oa, Nîce, and Marĕn′go are celebrated places; the former as the birthplace of Columbus, and the latter for one of the most brilliant of Napoleon's victories. Spĕz′ia, on the Mediterranean, possesses one of the finest harbors in Europe, and is the rendezvous of the American squadron in the Mediterranean.

Monaco is a small principality under the protection of Sardinia.

Lombardy and Venice form the northern and eastern part of Italy, and border on Austria, to which government they belong. They are fertile regions, and have been considered the granary of Europe. *Venice,* the ancient capital, is one of the most remarkable cities in Europe, being built on 70 islands, and having 500 bridges. It has canals for streets, and gondolas, or boats, in place of carriages. Its history is exceedingly interesting.

Mĭl′an, now the capital of the Lombär′do-Venētian kingdom, is a splendid city, famed for its cathedral, the exterior of which, with its hundred spires, and its three thousand statues of various sizes, looks like a forest of marble. This city is distinguished as the centre of learning and the arts. Bres′cia, Cremō′na, and Măn′tua, Pä′dua, Vicĕn′za, and Verō′na are also important places.

§ 13. Turkey.

Area, 189,470 square miles. Population, 15,500,000.

The Ottoman Empire, partly in South-eastern Europe and partly in Western Asia, comprises some of the most celebrated, best situated, and naturally finest provinces of their respective continents. European Turkey is divided into nine provinces: Roomē′lia, Thes′saly, Albā′nia, Hërtzegō-vî′na, Bŏs′nia and Croā′tia, Ser′via, Bûlgā′ria, Wâllā′chia, and Moldā′via. The government is an absolute monarchy, vested in a Sultan, who usually delegates his authority in civil and military affairs to the Grand Vizier, as his absolute lieuten-

---

Tuscany. Florence. Leghorn. Parma, Modena, and Lucca. Sardinia. Turin. Genoa and Marengo. Spezia. Monaco. Lombardy and Venice. City of Venice. Milan. Other important places. — Turkey. The Ottoman empire.

ant. There is a Council, composed of the principal ministers of state, called the "Divan′," which makes all laws, decides suits, issues firmans, &c. The imperial court is usually styled the "Sublime Porte." The governor of a province is called a Pachâ′. In religion, all the Turks, and a great part of the Albanians, are *Mohăm′medans;* the Greeks, Wâllā′chians, Moldā′vians, Ser′vians, and Bŭlgā′rians are members of the *Greek Church;* the Armenians adhere to the Greek Church, and the Jews hold to the laws of Moses. The climate is agreeable, and the soil fertile and productive. The most valuable fruits grow spontaneously, and the grain crops are generally more than sufficient for home consumption. Agriculture, however, is little understood, and less practised; for such is the nature of the government that property is insecure, and industry is obstructed.

Constantinople, the capital, on the Bŏs′porus, is built on seven hills, and has a safe, capacious, and beautiful harbor. The gilded domes and elegant minarets of its numerous mosques, rising from the bosom of the beautiful groves, give it a magnificent appearance at a distance; but a nearer inspection presents a confused mass of narrow, winding, steep, and dirty streets, with low and gloomy houses. Sălonî′ca, the second commercial city of European Turkey, stands on the Gulf of Sălonî′ca. Here was situated the Christian church to which St. Paul addressed his two Epistles to the Thessalonians.

The three provinces or principalities of MOLDAVIA, WALLACHIA, and SERVIA, of which *Jăssy*, *Bucharĕst′*, and *Belgrāde′* are the capitals, are tributary to the Porte, but are otherwise independent.

§ 14. GREECE.

Area, 18,244 square miles. Population, 998,226.

GREECE is, in many respects, one of the most celebrated countries of the world. Formerly it was the seat of civilization, learning, literature, and the arts, and the whole world was its tributary. Modern Greece is but a small province of its once mighty dominion. It is bounded on the N. by the Turkish provinces of Albania and Thessaly; E. by the

---

European Turkey. Provinces. Government. The Divan. Sublime Porte. Pacha. Religion. Climate, &c. Constantinople. Salonica. Moldavia, Wallachia, and Servia. — GREECE. Modern Greece. Boundaries. Three

Archipelago; S. and W. by the Mediterranean. It comprises three distinct portions: HELLAS, or Greece Proper, the MOREA, or Peloponnesus, and the Greek Islands of the Archipelago. The peninsula of the Morē′a is connected with the main land of Hellas by the Isthmus of Cŏr′inth.

The government is a constitutional monarchy. The prevailing religion is that of the Greek church. The face of the country is uneven and rugged. The soil is best adapted to pasturage, and the management of sheep is well understood. Grains and choice tropical fruits are the staple productions. *Athens*, the capital, and one of the most celebrated cities of the world, is situated near the Gulf of Egî′na. The antiquities of Athens are the great attraction — the Acrŏp′olis, or citadel; the remains of ancient temples, both within and without the walls; the harbor of the Piræ′us, five miles below the city. Năp′oli, in the Morē′a, is a place of some trade; it is strongly fortified, and has an excellent harbor. Lepăn′to, Missolŏn′ghi, Cŏr′inth, Navarî′no, Spar′ta, and the Pass of Thermop′ylæ are all renowned in history.

§ 15. THE IONIAN ISLANDS.

The IONIAN REPUBLIC comprises the Islands of Cerî′go, Zăn′te, Cephalō′nia, Ith′aca, Sănta Mâu′ra, Paxo, and Cŏr′fu. They are under the protection of Great Britain. *Corfu* is the capital. The people are chiefly Greeks and Italians. Wine, olive oil, and currants are the chief articles of trade.

§ 16. EUROPEAN RUSSIA.

Area, 1,606,871 square miles. Population, 62,088,000.

EUROPEAN RUSSIA lies between the Arctic Ocean on the N., and the Caucā′sian Mountains, Black Sea, and Danŭbe River on the S., and comprises more than one half of Europe. It belongs for the most part to the great central plain of Europe. The settled population is divided into six great classes: nobles, clergy, citizens, peasants, serfs, and slaves. Public schools are subjected to the direct control of the government. The Greek church is the religion of the state.

Sections. Morea. Government. Religion. Face of the country. Produce. Athens. Napoli. Other renowned places. — IONIAN REPUBLIC. Government. Corfu. — EUROPEAN RUSSIA. Situation. Classes of the inhabitants. Educa-

Rŭssia is one of the "Five Great Powers" of Europe. All power is vested in the Czar. He is the central point of the administration of government. He assumes the title of Autocrat of all the Russias. He delegates authority to the three great boards of administration, which are the Council of the Empire, the Directing Senate, and the Holy Sy̆nod. The commerce of Rŭssia is very considerable, and internal traffic is annually increasing. Nŏvgorŏd′, on Lake Il′men, is the great centre of inland trade. Its annual fair is perhaps the largest in the world. Rye, oats, wheat, barley, hemp, and flax are the chief productions, which, with iron, furs, leather, and tallow, form the principal articles of export.

St. Petersburg, on the Nē′va, at the head of the Gulf of Finland, is the capital, and one of the most magnificent cities in the world. Mos′cow, the former capital, is situated on the Moskwa River. It is memorable for its conflagration in 1812, on the approach of the French army under Napoleon. Warsaw, on the Vĭs′tula, was the capital of Pōland, formerly the largest kingdom in Europe. Crōn′stadt, situated on the Bay of Crōn′stadt, 20 miles from St. Petersburg, is the great naval station of the Rŭssian fleet in the Baltic. Arçhăn′gel is situated near the mouth of the Dwī′na: it has a fine harbor opening into the White Sea, and is the depot of merchandise destined for Siberia. Rī′ga is an important commercial town, situated at the head of the Gulf of Rī′ga. It is one of the most important fortresses in the Russian empire.

Odessa, in Southern Rŭssia, is the first commercial town on the Black Sea. Sevăs′topōl, on the W. coast of the Crimē′a, is the principal naval station of Rŭssia in the Black Sea. Astrakhăn′, at the entrance of the Vol′ga into the Caspian Sea, is noted for its commerce, manufactures, and fisheries. Crä′cow, the capital of the late republic of Crä′cow, was the ancient capital of Poland; it stands on the Vis′tula, 160 miles S. S. W. of Warsaw.

§ 17. SWEDEN.

Area, 170,096 square miles. Population, 3,316,536.

The KINGDOM OF SWEDEN forms the eastern portion of the Scandinavian peninsula, as far north as the River Tornē′a.

---

tion. Religion. Its political relations. The czar. Boards of administration. Commerce. Novgorod. Productions. St. Petersburg. Moscow. Warsaw. Cronstadt. Archangel. Riga. Odessa. Sevastopol. Astrakhan. Cracow

It is chiefly a barren country, descending in long slopes, and interrupted by small level plains, and occasionally by ranges of hills. The most southerly portion is low and flat, and is the most fertile. The country is covered, in the greater part, with pine forests. Agriculture and manufactures are in a low condition: farmers cannot find a market for their surplus produce, and corporations monopolize every art and trade. The chief exports consist of iron, timber, copper, tar, and grain. Schools are established in every parish: ninety-nine persons out of every hundred of the total population can read and write. The government is a sort of constitutional monarchy.

Stock'hōlm, the capital, is situated upon a strait which connects the Mā'lar Lake with an arm of the Bâltic. The principal public buildings are placed on three islands, which are connected with the main land and with each other by several bridges. Up'säl, built on a gentle height and part of an adjoining plain in a very fertile country, is one of the most beautiful old-fashioned cities of Europe. Gōth'enbûrg, three miles from the Căt'tegat, is the second town in the kingdom, with respect to commerce, manufactures, and population. Carlscrō'na, on the S. E. coast, is a strong town, with a fine harbor. It is the station of the Swedish navy.

§ 18. NORWAY.

Area, 122,008 square miles. Population, 1,328,471.

NORWAY occupies the western portion of the Scandinavian peninsula. With few exceptions, the valleys only are inhabited. The chief resources of the people are their fisheries, cattle, and iron, copper, and silver mines. The government is a limited monarchy. The executive power is vested in the King of Sweden; but the legislative power is solely confided to the Stor-thing, or Parliament, composed of members elected by the people. *Christiania*, the capital, stands at the head of a long fiord, on a low slope surrounded with beautiful heights. The foreign trade is considerable.

—SWEDEN. Face of the country. Of industrial pursuits. Exports. Education. Government. Stockholm. Upsal. Gothenburg. Carlscrona.—NOR-

§ 19. DENMARK.

Area, 21,856 square miles. Population, 2,296,597.

DENMARK comprises the peninsula of Jutland, the islands of Zēa'land, Fu̍'nen, Läaland, with the duchies of Hōls'tein and Lau̍'enburg. The face of the country is similar to that of Holland. The rugged and dreary islands of Faroe and Iceland belong to this government. Denmark was formerly an absolute monarchy; but in 1834 the king gave his people a free constitution, relinquishing a large share of royal power.

Copenhagen, the capital, on the Island of Zealand, is one of the finest cities in Europe. It has an excellent harbor, and an extensive commerce. Elsinōre', on the Sound, is the place where vessels passing to and from the Bâltic pay toll to Denmark. More than 18,000 vessels pass this place in the course of a year. The tolls yield a large revenue to the government.

EXERCISES IN VOYAGES AND TRAVELS.

Travel by railroad from Hamburg to Trieste, naming the states you would cross, the cities you pass through, and the battle fields on or near the route. Travel from Bremen to Lake Constance. From Dusseldorf to Basle. From Liverpool to London. From London through Birmingham to Holyhead, and thence to Dublin and Galway. Route of a mail steamer from Liverpool to New York. Trace a ship with a cargo of hemp from Cronstadt to Philadelphia. A cargo of wheat from Odessa to Bristol, England. A cargo of dried fruits and drugs from Smyrna to Boston. Import a cargo of cotton from New Orleans into Havre.

WAY. Resources. Government. Christiania.—DENMARK. Face of the country. Government. Copenhagen. Elsinore.

CHAPTER VII.

POLITICAL DIVISIONS OF ASIA.

§ 1. Inhabitants and Countries.

Asia is not only the most populous of the continents, but it also comprises within its limits the greatest variety in the species of the human race. The principal varieties are the Hindoos, the Chinese, the Tartars, the Arabs, and the Persians. The Hindoos and Arabs are generally considered as belonging to the Caucasian or white race; the Persians are a very mixed race; the Tartars differ from the Hindoos and Arabs in feature, complexion, form, manners, and language, and constitute the original stock of the Ottomans, who have long been the ruling people in South-western Asia; the Chinese are unquestionably of the Mongolian family. Besides these native families there are numerous colonies of Europē′ans in most parts of Asia; the Greeks in the Ottoman empire; the Rŭs′sians in Siberia; the English, Scotch, Irish, Portuguese, French, and Danes in India; the Dutch in Ceylōn′, Jä′va, and the Moluc′cas; and Spaniards in the Philĭp′pines. Asia may be said, in general, to afford examples of every possible kind of government, from the most licentious republicanism to the most atrocious despotism.

§ 2. Turkey in Asia.

Asiatic Turkey includes three distinct geographical regions, viz., Asia Minor and Armē′nia, Mesopotā′mia, and Syria, including Palestine. The Euphrā′tes and Tī′gris are the two great rivers. The government is the same as that of European Turkey.

Asia. Varieties of the human race. Hindoos and Arabs. Persians. Tartars. Chinese. European colonies. Governments. — Asiatic Turkey.

Smyr'na, an ancient and celebrated city, and the chief commercial place, is situated on the west coast of Asia Minor; it has a convenient and capacious harbor. The trade in dried fruits is immense. *Ango'ra,* 350 miles north-east of Smyrna, is noted for its goat's hair shawls. *Erz'room* is the chief town of Armē'nia. *Alep'po* is the emporium of Northern Syria, and is famous for its manufactures of silk stuffs, with gold and silver thread. *Damăs'cus,* situated in a fertile plain in the east of Syria, is one of the most ancient cities in the world. It is the point of union for the caravans of pilgrims from the north and east of Asia who travel towards the Holy Land of Arabia. *Jerusalem,* the Holy City of the Scriptures, in Palestine, stands on a hill, about 40 miles east of the Mediterranean Sea. The chief support of the city at the present time is derived from the numerous pilgrims and travellers who resort there to visit the holy places. *Trebisonde,* on the Black Sea, is an important commercial point, being the port of entry for large amounts of merchandise intended for Georgia and Persia.

§ 3. Arabia.

Arabia is a country of great extent and of much historical interest. The seas which surround it are of the highest commercial importance. The nature of the country keeps the Arabs divided into petty tribes, and nowhere admits of large bodies being consolidated into states. Their governments are, accordingly, of the simplest kind, and their princes have very limited powers.

Mec'ca, the capital of Hĕd'jaz, is noted as the birthplace of Mā'homet, and the centre of the Mŏs'lem religion. It is annually visited by pilgrims from all parts of the Mohăm'medan world. *Medi'na,* 25 miles north of Mec'ca, is the principal fortress of Hĕd'jaz. *Mō'cha,* in the south-west of Arabia, on the Red Sea, is a great coffee market. *Aden* is a station on the steamboat route to India. *Muscăt'* is the capital of Omăn', on the eastern coast, and its imâum' is one of the most powerful of the Arabian princes. It is considered the hottest town on the globe.

Three regions. Rivers. Government. Smyrna. Angora. Erzroom. Aleppo. Damascus. Jerusalem.—Arabia. Effects of the physical structure of the country upon civilization and government. Mecca. Medina. Mocha.

§ 4. Persia.

Persia really extends from the mountains of Koordistan′ to the Indus River, and is divided politically into three independent states, viz.: the kingdom of Iran′, or Persia Proper, Afghanistăn′, and Beloochistăn′.

§ 5. The Kingdom of Iran,

Or Persia Proper, presents a singular succession of low, arid plains, deserts, mountains, and table lands. The whole country is remarkably destitute of water; it has scarcely a river deserving the name. The people are divided into two classes — the fixed, or sheherêês′, which inhabit the cities, and are a fine race, tall, and generally strong and active; and the wandering, or eilânts′, who are rude, violent, and rapacious, but sincere, hospitable, and brave. The government is a military despotism. For administrative purposes the kingdom is divided into large provinces. The Persians manufacture beautiful carpets, silks, shawls, cottons, and porcelain.

Tehrän′, the capital, is situated in the midst of a well-cultivated plain, and surrounded by a high and strong wall of earth. *Ispahän′*, formerly the capital, and most splendid city of Western Asia, is still great in population, trade, and manufactures.

§ 6. Afghanistan.

The Af′ghans are divided into small tribes, and their chiefs, or khäns, are elected by the people of each tribe. They are mostly a pastoral people, and their subsistence depends chiefly on the produce of their flocks. *Cabôôl′*, the capital, is situated on the Cabôôl′ River, a branch of the Indus, in a large, well-watered plain, and surrounded with beautiful gardens. *Herăt′* is a large, fortified city, in a highly-cultivated valley, enjoying an extensive commerce and flourishing manufactures.

Muscat. — Persia. Divisions. — Iran. Classes of the people. Government. Manufactures. Tehran. Ispahan. — Afghanistan. Cabool. Herat.

§ 7. BELOOCHISTAN.

The people of this country are almost equally divided into two distinct nations — the Belôô′ches in the west, and the Brăh′oes in the east. They are almost entirely a rude, pastoral people, living in tents, and moving from place to place with their flocks and herds. *Kelăt′* is the chief city.

§ 8. HINDOSTAN, OR INDIA.

The natural boundaries of this country are well defined, having the Himalaȳ′a Mountains along the whole northern border, and the southern portion circumscribed by the Indian Ocean. The diversity of character and language, of form and complexion, of manners and customs, among the natives of India is extraordinary. The Hindoos are divided into four castes or classes: first, the Brăh′mins, or priests; second, soldiers; third, merchants and farmers; fourth, sŭ′dras, or laborers.

These castes are not permitted to intermarry, nor even to eat or drink with each other. The slightest digression from the laws of caste subjects the offender to loss of caste, and sometimes to death. This rigorous classification of the Hindoos presents may obstacles to the improvement of the lower classes and the advancement of Christianity in India.

The influence of the Europē′an population, however, has greatly modified these ancient customs, and may in time effect a thorough revolution in all these respects. In the native states the government is a pure despotism. The superintendence, direction, and control of the whole civil and military government of BRITISH INDIA is vested in a Governor General and Councillors, who are indirectly responsible to the Parliament of England. British India comprises the three presidencies of Bengâl′, Madrăs′, and Bombāy′.

Calcŭt′ta, the capital of all British India, is situated on the left bank of the Hôôg′ly River, 100 miles from the sea. The southern or Europē′an part of the city is finely and magnificently built. *Allahabăd′*, the capital of the north-western

---

— BELOOCHISTAN. Two nations. Mode of life. Kelat. — HINDOSTAN. Extraordinary points. Four castes. Laws of castes. Obstacles to Christianity. European influence. Government in the native states. Government in British India. Three presidencies. Calcutta. Allahabad. Benares. Delhi.

provinces, is situated at the confluence of the Găn′ges and Jŭm′na.

Benä′res, the sacred capital of Hindooism, is a large city on the Găn′ges, and is the chief seat of Brahmin′ical learning. Dĕl′hi, on the Jŭm′na, is the residence of the Great Mogŭl′, whose empire is now limited to the walls of his palace, and whose revenue consists of a pension from the "British East India Company."

Madras′ is situated on the Coromăn′del coast, in the Lower Carnăt′ic; it is the capital of Southern India, and a stopping-place on the route to Calcutta. *Bombay′*, on the west coast of Hindostăn′, is the capital of the presidency, and second only to Calcŭt′ta in commercial importance. Surăt′ is the seat of the supreme court of the presidency, situated on the Taptēē′ River, near the Gulf of Cambay′.

Among the many other towns in Hindostăn′ considered as important are. Sĭ′kim, near the foot of Mount Kunchingĭn′ga, the highest summit in the world; Cashmēre′, on account of its shawls of goat's wool, is the most noted town in the extreme north; Lahōre′, the capital of the kingdom of that name; Pondicher′ry, the French capital, south of Madräs′; Serampōre′, a Danish town in Bengâl′, on the Hôôg′ly, the residence of the Baptist missionaries.

§ 9. The Island of Ceylon.

This is the most magnificent island on the face of the globe. It has long been famed for its precious stones and pearl fishery; and its vegetable productions are not less valuable. The cinnamon tree grows wild as well as in a cultivated state, and the cocoa nut, bread fruit, and jack fruit trees supply the natives with food. Cotton, sugar cane, tobacco, and coffee grow luxuriantly and without care. The pepper vine grows wild over all the island, and enchanting groves of a thousand spices surround the villages in every part. Ceylōn′ is now entirely in the possession of the British. The American missions here have been eminently successful. *Colom′bo*, the capital, is a handsome town, and strongly fortified. Point de Galle is one of the stopping-places on the route to Calcutta and Hong Kong.

Madras. Bombay. Surat. Other towns.—The Island of Ceylon, Govern-

§ 10. INDO-CHINA.

INDO-CHINA, or FARTHER INDIA, is the name given to an extensive region lying to the south-east of Hindostăn′, and south-west of China. It is divided politically into various independent states. The governments are all pure despotisms; nevertheless, the enjoyment of life and property is more secure than in other Asiatic states. Indo-China comprises six political regions, viz.: Bïr′mah, Siăm′, Anăm′, Lä′os, British territories, and Malăc′ca.

BIRMAH consists of two divisions — Pegū′, which comprises the sea coast and the mouths of the rivers; and A′va, the upper country. *A′va*, the capital, stands on the Irawä′dy River; its temples and gilded towers give it an imposing appearance. Rangôon′ is the chief seaport. Pegū′ is the ancient capital.

SIAM consists of the valley of Meinăm′. The Siamese belong to the Mongō′lian race. *Bankŏk′* is the capital, situated on the Meinăm′, about 20 miles from the sea.

ANAM embraces Tonquîn′, Cō′chin-Chī′na, Cambō′dia, and a part of Lä′os. *Hue′*, the capital, is a well-fortified city on a small river, about 10 miles from the sea.

LAOS is a mountainous region north of Cambō′dia and Siăm′. The scenery is beautiful; the soil is in general fertile; and the country is rich in gold, silver, copper, and iron. *Zemmaī′* is the capital, 400 miles north of Bankŏk′.

§ 11. THE BRITISH PROVINCES.

The possessions of Great Britain in In′do-Chī′na consist of several detached provinces and islands. *Amherst* is the capital of Martabăn′, though inferior to Moulmeīn′ in its advantages for commerce. *Malăc′ca*, the principal town of the Malāy′ peninsula, is the seat of a college for the cultivation of European and Chinese literature. *Singapōre′* is situated on an island of the same name, at the southern extremity of the Malāy′ peninsula. It is a flourishing place, possessing many advantages, and is a stopping-place on the route to Hong Kong.

---

ment. Columbo. — INDO-CHINA. Governments. Six political divisions Birmah. Pegu. Ava. Capital of Birmah. Rangoon. Pegu. Siam. Race Bankok. Anam. Hue. Laos. Zemmai.— BRITISH POSSESSIONS. Amherst.

§ 12. The Peninsula of Malacca.

This is a long, narrow tract, 750 miles long by 60 to 170 miles wide. The southern portions are chiefly inhabited by Malāys′, and are divided into a number of petty states or kingdoms. These people are celebrated for their ferocious character and piratical habits. " A bulldog does not differ more in form and quality from a greyhound than a Malāy′ from a Hindôô′."

§ 13. The Chinese Empire.

The Empire of China, comprising China Proper and several external territories of vast extent, forms one of the largest, and, in regard to population, civilization, and industry, one of the most remarkable nations in the world. Its history, its government, and its manners are peculiar to itself. The rivers of China form one of its most conspicuous features. No country can compare with it for natural facilities of inland navigation. The empire is divided into three principal parts, viz.: China Proper, Mantchôô′ria, and the Colonial Possessions. The latter includes Mongō′lia, Eastern Toorkistăn′, and Tibĕt′.

§ 14. China.

China occupies the south-eastern portion of the empire. It is bounded on the E. and S. E. by the Pacific; S. by Bïr′-mah and Anăm′; N. by Mantchôô′ria and Mongō′lia; and W. by Tibĕt′. The people are divided into four ranks or orders — the learned, the farmers, the manufacturers, and the merchants. The members of the imperial family alone possess hereditary rank, and are distributed into five classes, all distinguished by wearing a yellow girdle.

The silk and cotton fabrics of the Chinese, their porcelain, embroidery, dyeing, and varnishing, ivory cutting, colors, paper, ink, and many other articles of art and skill, are unequalled by any other nation. In agriculture every acre of

---

Malacca. Singapore. — Peninsula of Malacca. Chinese empire. Rivers. Three divisions of the empire. — China Proper. Boundaries. Orders of the people. Imperial family. Productions of the Chinese. Of agriculture. The arable land is employed in raising food; even the mountains are cut into terraces for cultivation. Since the opening of the five ports of Cantŏn′, Amöy̆′, Footcheôô′, Ningpō′, and Shanghaī′, by a treaty with England in 1842, the foreign commerce of China has greatly increased. Teas and silks are the chief articles of export.

Peking′, the capital of the empire, in the north-east, is the largest city of China. It is composed of two parts entirely distinct from each other, viz.: the Imperial Town, containing the imperial palace and the great offices for the government of the empire; and the Chinese Town, which is situated without the walls of the principal city. *Nankin′*, situated near the Yăng-tse-kiăng′, about 120 miles from its mouth, is the first city in manufactures, and is noted for its lofty porcelain tower.

Cantŏn′, on the Hoăng′ Kiăng′, is the chief port of foreign trade. *Macä′o* is a Portuguese town, near the sea, just within the entrance of the Gulf of Cantŏn′. *Amöy̆′* is favorably situated for access, and the harbor is one of the best on the coast. *Footcheôô′* lies north-east of Amöy̆′, in a plain surrounded by hills. *Ningpō′* is admirably situated for trade, at the junction of three rivers, in about 30° N. lat. *Shanghaī′* is the largest seaport in Kiăng′-su. The native trade here is probably larger than at any other city in China, and near 1000 junks have been counted at one time lying in the river east of the town. Hong Kong Island was ceded to the English in 1842.

MANTCHOORIA comprises all the most eastern portion of the high table land of Central Asia. Most of this territory is a wilderness. Chĭng-yăng is the metropolis.

MONGOLIA lies north of China Proper, and west of Mantchôô′ria. It is described as an elevated plain, almost destitute of wood or water. The central part is occupied by the Desert of Cō′bi.

TIBET constitutes the most southern of the great central table lands of Asia, and is the least known of all. *Lăs′sa*, the capital, is the largest town in this part of Asia. It is famous for its convents, and the head quarters of Bŭddh′ism.

COREA is a peninsula, having the Yellow Sea on the west, and the Sea of Japăn′ on the east. It forms a separate kingdom. *Kingkita′o*, the capital, is situated near the centre of the country.

---

five open ports. Export. Peking. Two parts. Nankin. Canton. Macao. Amoy. Footcheoo. Ningpo. Shanghai. MANTCHOORIA. — MONGOLIA. —

§ 15. TOORKISTAN, OR INDEPENDENT TARTARY.

TOORKISTAN IS an extensive country lying next north of Iran′ and Afghanistăn′. It is divided into a number of states, each governed by a chief or khän. The principal states are Khî′va, Khokăn′, and Bokhä′ra. The people are industrious, and chiefly engaged in agriculture and trade. *Bokha′ra* is the most commercial town of Central Asia; by means of caravans it carries on an active trade with Russia, Turkey, Persia, Afghanistăn′, India, and China.

§ 16. SIBERIA.

SIBERIA is the general name of the vast region owned by Russia occupying all the northern parts of Asia, between the Altaī′ range and the Arctic Ocean. The trade with foreign nations is very extensive and profitable.

Tobŏlsk′ is the centre of the greatest amount of commerce. The productions of the mines, fisheries, and hunting expeditions are here exchanged for European and Chinese goods.

Irkutsk′ is the chief town in Eastern Siberia. It is the handsomest in appearance, and the most elegant as to society in the country. The principal inhabitants are merchants and the civil and military officers of government. Yakŭtsk′, on the River Lē′na, in 62° N. lat., is probably the coldest town on the earth. The cold is so intense that mercury is constantly frozen for two months in the year.

§ 17. THE EMPIRE OF JAPAN.

This empire consists of a group of large islands in the Pacific Ocean, separated from China by the Channel of Tartary and the Sea of Japăn′. The principal islands are Nî′phon, Sikōke′, Yĕs′so, and Keôô′-seôô′. The first is by far the largest and most important of the group. Its length is nearly 900 miles, and its mean breadth over 100 miles.

The Japanese are a mixed race, of Mongol and Malāy origin. In capacity and industry they are not inferior to any

---

TIBET.—COREA.—TOORKISTAN. Principal states. The people. Bokhara.—SIBERIA. Trade. Tobolsk. Irkutsk. Yakutsk.—EMPIRE OF JAPAN. Chief islands. Race. Government. Mechanical skill. Trade.

of the Asiatics. They evince uncommon skill in the mechanic arts, and excel in smelting and refining metals. The government is despotic; but the emperor himself is considered as subject to the laws, which are of long standing and cannot be easily changed. In their moral character they are represented as manly, honest, and brave, and as entertaining a high sense of honor. The prevailing religion is Bŭddh′ism.

The coasting and inland trade of Japan is very extensive. Its fisheries stand foremost in its resources; the sea and its productions contribute as much to the sustenance of the natives as do the fruits of the earth, rice, perhaps, excepted. An expedition to Japan sailed from the United States of America in 1853, under the command of Commodore Perry, for the purpose of opening the ports of this country to the maritime nations of the world. He succeeded in negotiating a treaty of commerce and friendship, which has since been ratified by both governments.

EXERCISES IN VOYAGES AND TRAVELS.

Travel by the overland routes from London to Bombay. From Bombay to Hong Kong, and ship a cargo of silks and teas to Boston. A whale ship from New Bedford to the fishing ground in the North Pacific, naming her probable stopping-places for ship stores, and her voyage homeward with a cargo of oil. Describe a voyage, by a line of steamers, from New York to Australia, via Panama. Voyage from Liverpool to Manilla.

CHAPTER VIII.

POLITICAL DIVISIONS OF AFRICA.

§ 1. INHABITANTS AND COUNTRIES.

THE continent of Africa is an immense peninsula, joined to Asia by the Isthmus of Suez, comprising an area of 11,870,000 square miles. The inhabitants consist of many varieties of the human species; the most remarkable and best known of these are the Hottentots and Caffres in the south, the Negro races on the south-west and in the interior, the Moors on the north, the Caucasian races in Abyssinia, and the Copts of Egypt. Feticism, a degraded superstition, is the religion of the greater number of the inhabitants, being professed by nearly all the negroes and the natives of Madagascar. A corrupt form of Christianity is professed in Abyssinia and part of Egypt; and Mohammedanism prevails in all the other regions. The governments are chiefly absolute despotisms. The Americans, English, French, Portuguese, Spaniards, and Dutch have colonial establishments in Africa. The population of the continent is merely conjectural, with the exception of Algeria, Liberia, Cape of Good Hope, and several small colonies and islands. The continent may be divided into five sections — North, Eastern, South, Western, and Central.

§ 2. NORTH AFRICA.

Barbary and the Countries of the Nile and Red Sea.

BARBARY, or Moorish Africa, comprises Marocco, Algeria, Tunis, Tripoli, Barca, and Sahara, extending west from Fezzan to the Atlantic, and south to Soudan. Barbary and

---

Population. Governments. Districts of the continent. — BARBARY STATES.

Egypt formed nearly all of Africa known to the ancients. It was peopled chiefly by Moors, Numidians, and Phœnician colonists; it attained great celebrity under the dominion of the Carthaginians, was afterwards subject to the Romans, and occupied for nearly a century by the Vandals. The Arabs took it finally from the Romans about B. C. 697, and it is now inhabited chiefly by Arabic, Saracenic, and Berber races. The people are ignorant and corrupt. Industry is discouraged, and agriculture is neglected.

MAROCCO, the capital city of the empire of Marocco, is situated in a fertile plain, 125 miles east of the Atlantic coast. It is enclosed by a strong, turreted wall, 30 feet in height and 6 miles in circumference, within which are many large fields and open spaces strewed with ruins. The city is ill built and filthy.

ALGERIA is a dependency of the French government. The commander-in-chief of the French forces there is Governor General. The capital, *Algiers*, is strongly walled and fortified, and is in the form of an amphitheatre, on a slope facing the sea. The Algerian Sahara is not, as was long supposed, a sterile desert, but a vast archipelago of oases, each of which presents an animated group of towns and villages, surrounded by olives, figs, vines, and palms.

TUNIS is one of the most fertile and best cultivated of the Barbary States, and in ancient times it was one of the granaries of Rome. Caravans come annually from Central Africa, bringing slaves, senna, ostrich feathers, gold dust, gum, and ivory, which are exchanged for manufactured goods, spices, and gunpowder. Others from Constantinople bring wax, dried skins, cattle, and sheep, in return for muslins and other woven fabrics. Ten miles north-east of the city of Tunis are the ruins of ancient Carthage. The government is exercised by an hereditary bey, who is nominally tributary to the Turkish sultan.

TRIPOLI, the most eastern of the Barbary States, comprises the state proper, with Barca and Fezzan. The coast line is of the most luxuriant fertility for a few miles inland, beyond which the whole country is little better than a sandy waste. The chief trade is in the barter of European goods for those of Central Africa. Barca is inhabited by wandering herdsmen; Derne, on the coast, is the largest town.

BELED-EL-JEREED, or the Land of Dates, extends along the northern edge of the Sahara. Dates of the finest quali-

---

Marocco. Algeria. Tunis. Tripoli. Barca. Beled-el-Jereed. Egypt.

ty are produced in abundance, and constitute the chief food of the people.

Egypt is noted for its great antiquity, and the early civilization of its inhabitants. Its mighty pyramids, splendid obelisks, and the ruins of ancient cities, are monuments of its former greatness. The greater part of the inhabitants are Arabs, though the Turks are the ruling people. The chief commercial relations with Arabia and India are carried on by Cossier and Suez. Since the establishment of regular steam packets in the Mediterranean and the Indian Ocean, Egypt has become the route to India for all the correspondence of Europe, as well as for the greater portion of travellers. The route from Cairo to Suez, 180 miles, is traversed by horses and vans, and the mail is conveyed in 18 hours. A railroad communication has been resolved on, and a portion of it is built. Egypt, under the government of Mehemet Ali, has made rapid progress in civilization. He has added to his territory Nubia, Kordofan, and part of Abyssinia. *Cairo,* the capital and largest city, is situated on the right bank of the Nile. Population, including the suburbs, estimated at 250,000. Alexandria, the chief seaport of Egypt, is near the west branch of the Nile, on the Mediterranean, 112 miles north-west of Cairo, with which it communicates by a canal and the Nile. It was once the most splendid city in the world, and the centre of science and commerce. It is now an important station in the overland route to India. Suez, on the Red Sea, is also on this route of travel.

Nubia is situated almost entirely in the valley of the Nile, which is here so narrow as to leave no space for cultivation on its banks, and the productive districts occur in the gorges between the mountains and on the islands. An extensive transit trade is carried on with the interior of Africa and Egypt in slaves, gold dust, senna, and ostrich feathers. *Suakim,* on the Red Sea, is the only port.

Abyssinia joins Nubia on the south-east, and borders on the Red Sea. It forms an elevated table land, containing many fertile valleys watered by numerous rivers, many of which are tributaries of the Nile. Abyssinia, in ancient times, appears to have been the cradle of African civilization; but the early history of the people is merely traditional. They were converted to Christianity in the time of Constantine, and their first rulers seem to have possessed great influence. The present inhabitants have preserved nothing

---

People. Route of travel. Cairo. Alexandria. Nubia. Towns. Abyssinia.

of their former power; the Turks on the one side, and the ferocious Gallas on the other, have almost entirely separated them from other nations. The empire has been divided into several petty states, the chief of which are Shoa, Tîgre′, and Amhä′ra. *Anko′bar*, capital of the kingdom of Shoa, is the only place deserving the name of a town in Abyssinia. Massouah, on the Red Sea, is the chief seaport.

§ 3. EASTERN AFRICA.

The Region from Delagoa Bay to the Confines of Abyssinia.

THE COUNTRY OF THE SOMAULIES.—The coast of Adel′, as well as the country of Ajan′, to the south of Cape Guardafuî′, and as far as the River Juba, a little south of the equator, has no other distinctive name than Barra Somâu′li, or Land of the Somâu′lies, a mild race, of pastoral habits, and confined entirely to the coast. *Berbe′ra,* on the northern coast, is the chief seaport, and the seat of a great fair. The exports are coffee, sheep, gum, myrrh, ostrich feathers, and gold dust.

The coast from the equator to Delago′a Bay is known under the names of Zanguebar′, Mozambîque′, and Sofä′la. It is chiefly occupied by negro tribes in a state of barbarism. The sovereignty, as far as Cape Delgä′do, is claimed by the Imâum′ of Muscat; the remainder, as far as Delago′a Bay, by the Portuguese. The Islands of Pemba, Zanzibar′, and Quî′loa, are the only important places of Zanguebar′; and Mozambîque′ is the only Portuguese port open to foreign commerce.

§ 4. SOUTH AFRICA.

The Region extending from Delagoa Bay around to Cape Negro.

CAFFRA′RIA lies between Sofä′la and Cape Colony. The Caffres do not form one political community, but are divided into various tribes. They are described as hospitable, intelligent, and brave, but dishonest and superstitious; their principal occupation is that of herdsmen.

CAPE COLONY.—The portion of Africa occupied by the British colony of the Cape of Good Hope consists of the

---

The Somaulies. Chief seaport. Exports. From the equator to Delagoa Bay. Caffraria. Caffres. Cape Colony. Government. Productions. Cape Town.

most southern part of the continent, extending from Port Natal River on the east to the Orange River on the west. The affairs of the colony are administered by a parliament, composed of the Governor, Legislative Council, and House of Assembly, elected for a term of five years. Corn, wine, wool, oil, provisions, aloes, and fruits are the staples of this fine colony. *Cape Town*, the capital and largest European settlement in Africa, is the best place of refreshment for ships between Europe and the East Indies.

HOTTENTOTIA, or the Country of the Hottentots, lies northwest of Cape Colony. There are several varieties of the race, and they are a quiet, inoffensive, ignorant, filthy, and degraded class of beings.

§ 5. WESTERN AFRICA.

The Negro Country, extending from Cape Negro to Cape Blanco.

LOWER GUINEA comprises several small states, the chief of which are Bengue′la, Ango′la, Congo, and Loan′go. The Portuguese claim jurisdiction over the greater part of the coast, and carry on the slave trade from the principal ports. San Felîpe′ is the chief town of the Bengue′la country, and is principally inhabited by free negroes and slaves. St. Paul de Loan′do is the capital of Ango′la, St. Salvador′ of Congo, and Loan′go of Loan′go.

UPPER GUINEA comprises a number of kingdoms, of which Benîn′, Dä′homey, and Ashantee′ are the most powerful. The coast from west to east has been divided into four regions, and named from the chief articles which they produce. These are the Grain Coast, the Ivory Coast, the Gold Coast, and the Slave Coast. Benîn′, a chief town, on the Slave Coast; Ashantee, on the Gold Coast; and Ab′omey, in the interior, are important places.

LIBERIA. — This is an independent republic. It was formerly a colony of free blacks and emancipated slaves from the United States, founded in 1821 by the American Colonization Society. Its independence was acknowledged by the United States and Great Britain in 1848. Thus far it has proved to be a most successful experiment for the civilization of Western Africa. The soil is rich, producing in abundance the tropical plants and fruits. Its commerce is rapidly in-

---

Hottentotia. Lower Guinea. States. Jurisdiction. St. Felipe. St. Paul. St. Salvador. Loango. Upper Guinea. Kingdoms. Regions of the coast. Benin. Ashantee. Abomey. Liberia. Soil. Commerce. Exports. Mon-creasing in value. Camwood, palm oil, ivory, hides, wax, and pepper are important articles of export. *Monrovia* is the capital. The climate is unsuitable for the white race, and therefore very few reside here.

Sierra Leone is a colony of free negroes, established by British philanthropists in 1787 for the purpose of introducing the Christian religion and civilization into Africa. The population is composed chiefly of liberated slaves taken from slave ships captured by the British navy. *Freetown* is the capital.

Senegambia extends from Guinea and Liberia to the Sahara, and is inhabited by negroes intermixed with Arabs and other tribes. It is watered by the Senegal and Gambia Rivers. In natural productions it is one of the richest regions. The heat is intense, and the climate extremely unhealthy for Europeans. *Teemboo′* is the chief town.

§ 6. Central Africa.

Soudan comprises several powerful and many small kingdoms south of the Sahä′ra and north of the Kong Mountains. The greater part of the population are negroes, but the ruling people are Moors. Its agricultural, mineral, and animal productions supply the materials of an immense commerce, which is carried on with the Barbary States and the west coast by caravans, and by flatboats on the rivers. Very little, however, is known of this region. Timbuctoo′ is the most noted of the Soudan′ states. It lies north of the River Joliba, and is the centre of the caravan road from Barbary. The chief places are Timbuctoo, Saccatoo, Kemmoo, Sego, Kooka, and Warra.

Ethiopia is an undefined, unknown region, occupying the table land of the interior, south of Soudan′.

§ 7. African Islands.

Madagascar, one of the largest islands in the world, presents a variety of surface and soil. Rice is the staple production. The inhabitants along the coast are Malays and Arabs; those of the interior are savages. *Tananarivô′* is the capital. *Tamatave* is the chief commercial town.

---

rovia. Sierra Leone. Population. Freetown. Senegambia. Soudan. Timbuctoo. Other towns. Ethiopia. Madagascar. Mauritius. Bourbon Island.

Mauritius, or the Isle of France, belongs at present to the British government. It is the scene of St. Pierre's tale of "Paul and Virginia." *Port Louis* is the capital.

Bourbon Island, in the Indian Ocean, east of Madagascar, is occupied by a French colony. The island is of volcanic origin, and is traversed from north to south by a chain of mountains, which divide it into two portions, differing in formation, climate, and productions. The exports are sugar, coffee, cloves, dye woods, and saltpetre.

Comoro Isles. — These are four in number, lying midway between Cape Delgado and the north of Madagascar. Exports, cocoa nut oil and tortoise shell.

Socotra Island lies 120 miles east of Cape Guardafui. The population is composed chiefly of Bedouins. Aloes and other gums of the finest quality are the chief productions.

Cape Verd Islands lie about 300 miles west of the cape, in the Atlantic Ocean. Cattle, dried and salted provisions, are the chief articles of export. These islands belong to Portugal. *Porto Praya* is the capital.

The Canaries are about 60 miles west of Africa. They belong to Spain, and are noted for their fruits, wines, and birds. They contain numerous mountains, some of which attain a great elevation, the Pico de Teyde, in Teneriffe, being 12,182 feet.

The Madeira Isles belong to Portugal. They have long been celebrated for their wines, coffee, and tropical fruits. *Funchal* is the capital.

The Azores, or Western Isles, comprise a group of nine islands, belonging to Portugal. The inhabitants are a mixture of Portuguese and negroes. The climate is very temperate and healthful, and grain crops and choice fruits are luxuriant. These islands afford a convenient resort for ships crossing the Atlantic. *Fayal* possesses the best harbor, and is the most frequented.

St. Helena, situated in the South Atlantic, 1200 miles from the coast, is noted as being the place of the imprisonment of Napoleon Bonaparte from 1815 to 1820. Nothing can exceed the variety of the vegetation, fruits, and grains produced here. *Jamestown,* on the north-west side, is the chief place.

Ascension, 800 miles north-west of St. Helena, is garrisoned by British troops, and strongly fortified, to serve as a place of refreshment for vessels employed on the coast of Africa.

Comoro Islands. Socotra. Cape Verd Islands. Port Praya. Canaries. Madeiras. Funchal. Azores. Fayal. St. Helena. Ascension.

APPENDIX.

TABLE

Of the Number of Geographic Miles in a Degree of Longitude, *under each Parallel of Latitude, according to the spheroidal Shape of the Earth.*

Parallel Latitude.	Geog. Miles in a Degree.	Latitude.	Miles.	Latitude.	Miles.
°		°		°	
* 0	60.000	30	52.004	60	30.074
1	59.991	31	51.475	61	29.161
2	59.964	32	50.930	62	28.240
3	59.918	33	50.370	63	27.310
4	59.854	34	49.793	64	26.372
* 5	59.773	*35	49.202	*65	25.426
6	59.673	36	48.596	66	24.471
7	59.556	37	47.975	67	23.509
8	59.419	38	47.339	68	22.540
9	59.266	39	46.688	69	21.564
*10	59.094	*40	46.021	*70	20.581
11	58.905	41	45.346	71	19.592
12	58.697	42	44.654	72	18.597
13	58.472	43	43.948	73	17.595
14	58.229	44	43.229	74	16.588
*15	57.968	*45	42.495	*75	15.577
16	57.690	46	41.750	76	14.560
17	57.394	47	40.992	77	13.539
18	57.081	48	40.220	78	12.514
19	56.751	49	39.437	79	11.485
*20	56.403	*50	38.642	*80	10.452
21	56.038	51	37.834	81	9.416
22	55.657	52	37.015	82	8.377
23	55.258	53	36.185	83	7.336
24	54.842	54	35,343	84	6.292
*25	54.410	*55	34.400	*85	5.246
26	53.962	56	33.627	86	4.199
27	53.496	57	32.754	87	3.150
28	53.015	58	31.870	88	2.101
29	52.518	59	30.977	89	1.050
*30	52.004	*60	30.074	*90	0.000

Geographic miles may be reduced to common miles by multiplying by 1.158.

TABLE OF HEIGHTS

OF SOME REMARKABLE POINTS ON THE EARTH.

NORTH AMERICA.		Latitude.	Longitude.	Elevat'n in Feet.
Coast Range Mountains.	*Country.*			
Mt. St. Elias,	Russ. Poss.,	60° 20′ N.	140° 30′ W.	17,860
Mt. Fairweather,	“ “	59° 2′ N.	137° 0′ W.	14,925
Mt. Baker,	Wash. Ter.,	48° 0′ N.	121° 30′ W.	10,000
Mt. Rainier,	“ “	46° 50′ N.	121° 0′ W.	10,000
Mt. St. Helen's,	“ “	46° 0′ N.	121° 55′ W.	12,000
Mt. Hood,	Oregon Ter.,	45° 5′ N.	121° 0′ W.	12,000
Shasta Peak,	California,	41° 15′ N.	122° 0′ W.	14,700
Sierra Nevada Range,	“	— —	119° 0′ W.	15,170
Rocky Mountains.				
Athabasca, Portage,	Br. America,	54° 0′ N.	118° 0′ W.	7,300
Mt. Brown,	“ “	52° 35′ N.	117° 30′ W.	15,900
Mt. Hooker,	“ “	52° 15′ N.	117° 12′ W.	15,700
Lewis and Clark's Pass,	Nebraska,	46° 30′ N.	112° 0′ W.	6,000
Fremont's Peak,	“	43° 15′ N.	109° 40′ W.	13,570
South Pass,	“	42° 15′ N.	109° 0′ W.	7,085
Long's Peak,	“	40° 20′ N.	106° 30′ W.	13,575
Pike's Peak,	Kansas,	39° 0′ N.	105° 45′ W.	11,320
Sangre de Christo Pass,	New Mexico,	37° 30 N.	106° 0′ W.	8,800
Spanish Peak,	“ “	37° 30′ N.	105° 10′ W.	11,000
El Paso,	“ “	31° 42′ N.	106° 30′ W.	3,814
Mexican Cordilleras.				
Coffre de Perote,	Mexico,	19° 28′ N.	97° 12′ W.	13,413
City of Mexico,	“	19° 25′ N.	99° 5′ W.	7,480
Nevado de Toluca,	“	19° 9′ N.	99° 26′ W.	15,542
Colima, (vol.,)	“	19° 4′ N.	103° 7′ W.	9,193
Orizaba, (vol.,)	“	19° 3′ N.	97° 11′ W.	17,374
Iztaccihuatl,	“	19° 0′ N.	98° 45′ W.	15,705
Popocatapetl,	“	18° 55′ N.	98° 30′ W.	17,717
Jorullo, (vol.,)	“	18° 54′ N.	101° 30′ W.	4,114
City of New Guatemala,	Cent. Amer.,	14° 36′ N.	90° 13′ W.	4,372
Volcan d'Agua,	“ “	14° 20′ N.	90° 45′ W.	12,620
Alleghanies.				
Mt. Katahdin,	Maine,	46° — N.	69° + W.	5,385
Mt. Washington,	N. Hamp.,	44° + N.	71° + W.	6,226
Grand Monadnock,	“	43° — N.	72° + W.	3,254
Mansfield Mt.,	Vermont,	44° 30′ N.	73° — W.	4,280
Saddle Mt.,	Massachus'ts,	42° 38′ N.	73° 15′ W.	3,505
Wachusett Mt.,	“	42° 30′ N.	71° 50′ W.	3,000
Mt. Marcy,	New York,	44° + N.	73° 45′ W.	5,467
Round Top, Catskill,	“	42° + N.	74° 0′ W.	3,804
Otter Peaks,	Virginia,	37° 30′ N.	79° 30′ W.	4,260
Bl'k Mt or Mitchell's Peak,	N. Carolina,	35° 40′ N.	82° 20′ W.	6,476

SOUTH AMERICA.

Andes.	*Country.*	Latitude.	Longitude.	Elevat'n in Feet.
Tolima, (vol.,)	N. Grenada,	4° 48′ N.	75° 36′ W.	18,314
Santa Fe de Bogota,	“	4° 35′ N.	74° 8′ W.	8,730
Pass of Quindiu,	“	4° — N.	76° — W.	11,500
Pichincha,	Ecuador,	0° 12′ N.	78° 35′ W.	15,922
Cayambe,	“	0° 4′ S.	78° 12′ W.	19,535
City of Quito,	“	0° 14′ S.	79° 4′ W.	9,543
Antisana,	“	0° 30′ S.	78° 18′ W.	19,137
Cotopaxi, (vol.,)	“	0° 41′ S.	78° 42′ W.	18,875
Chimborazo,	“	1° 30′ S.	79° 11′ W.	21,424
Tunguragua,	“	2° — S.	78° — W.	16,420
City of Cuzco,	Peru,	13° 31′ S.	72° 4′ W.	11,384
Sorata,	Bolivia,	15° 40′ S.	68° 54′ W.	21,290
Arequipa,	Peru,	16° 14′ S.	71° 50′ W.	20,320
Illimani,	Bolivia,	16° 42′ S.	68° 20′ W.	21,150
City of Cochabamba,	“	17° 21′ S.	65° 43′ W.	8,434
Sahama, (vol.,)	“	18° 0′ S.	69° 30′ W.	22,350
Gualatieri, (vol.,)	“	18° 23′ S.	69° 0′ W.	21,960
City of Chuquisaca,	“	19° 3′ S.	64° 30′ W.	9,343
City of Potosi,	“	19° 34′ S.	65° 25′ W.	13,330
Pass of Come Cabello,	Chile,	27° 30′ S.	69° — W.	14,520
Pass of Dona Ana,	“	29° 36′ S.	69° — W.	14,829
Aconcagua, (highest of the Andes,)	“	32° 50′ S.	70° 0′ W.	23,910
Pass of Aconcagua,	“	33° 55′ S.	70° 0′ W.	14,000
Pass of La Cumbre,	“	33° 0′ S.	70° 20′ W.	12,454
Yanteles,	Patagonia,	43° 20′ S.	73° 0′ W.	8,030
Mt. Darwin,	Tierra del Fuego,	54° 0′ S.	69° 0′ W.	6,800
Duida,	Venezuela,	3° 17′ S.	66° 40′ W.	7,149
Itambe,	Brazil,	19° 0′ S.	43° 0′ W.	5,960
Itacolumi,	“	21° 0′ S.	44° 45′ W.	5,750
EUROPE.				
Mont Blanc,	Savoy,	45° 50′ N.	6° 52′ E.	15,739
Monte Rosa,	Piedmont,	45° 55′ N.	7° 50′ E.	15,210
Jungfrau,	Switzerland,	46° 30′ N.	7° 55′ E.	13,672
Monte Viso,	Sardinia,	48° 38′ N.	7° 2′ E.	13,600
Ortler Spitz,	Tyrol,	46° 25′ N.	11° 0′ E.	12,851
Gross Glockner,	“	47° 0′ N.	12° 40′ E.	12,425
Mont Terglou,	Illyria,	46° 22′ N.	13° 51′ E.	9,386
Pass of the Stelvio,	Tyrol,			9,177
“ “ the Splugen,	Switzerland,	46° 25′ N.	9° 11′ E.	6,946
“ “ the Simplon,	“	46° 13′ N.	8° 15′ E.	6,578
“ “ St. Gothard,	“	46° 32′ N.	8° 30′ E.	6,808
“ “ the Little St. Bern'd,	Savoy,	45° 50′ N.	6° 50′ E.	7,200
“ “ Mont Cenis,	Piedmont,	45° 7′ N.	6° 35′ E.	6,784
“ “ Mont Genevre,	“	44° 50′ N.	6° 50′ E.	6,197
Monte Como,	Italy,	42° 23′ N.	13° 41′ E.	9,521
Vesuvius,	Naples,	40° 49′ N.	14° 26′ E.	3,987

EUROPE. — CONTINUED.		Latitude.	Longitude.	Elevat'n in Feet.
Mountains.	*Country.*			
Brocken, Harz,	Saxony,	51° 48′ N.	10° 36′ E.	3,740
Lomnitz Peak,	Hungary,	49° 2′ N.	20° 18′ E.	8,779
Munich, city,	Bavaria,	48° 8′ N.	11° 34′ E.	1,764
Geneva, city,	Switzerland,	46° 12′ N.	6° 9′ E.	1,450
Schneehatten,	Norway,	62° 11′ N.	9° 0′ E.	8,120
Mulahacen,	Spain,	37° 10′ N.	3° 28′ W.	11,483
Mont d'Or,	France,	45° 22′ N.	3° 3′ E.	6,220
Parnassus,	Greece,	38° 37′ N.	22° 28′ E.	8,068
Taygetus,	Morea,	36° 57′ N.	22° 22′ E.	7,904
Mount Etna,	Sicily,	37° 45′ N.	15° 5′ E.	10,874
Stromboli,	Lipari Isl.,	38° 49′ N.	15° 13′ E.	2,687
Ben Nevis,	Scotland,	56° 48′ N.	5° 0′ W.	4,368
Helvellyn,	England,	54° 31′ N.	2° 50′ W.	3,313
Snowdon,	Wales,	53° 4 N.	4° 4′ W.	3,557
Hecla,	Iceland,	64° 0′ N.	19° 40′ W.	5,210
ASIA.				
Kunchinginga,	Sikim,	27° 50′ N.	88° 30′ E.	28,178
Dhawalaghiri,	Nepaul,	29° 0′ N.	83° 0′ E.	28,080
Jawahir,	Delhi,	30° 35′ N.	80° 30′ E.	25,670
Chamalari,	Bootan,	28° 0′ N.	90° 0′ E.	23,929
Ararat,	Persia,	39° 42′ N.	44° 35′ E.	17,212
Horeb,	Syria,	28° 30′ N.	34° 0′ E.	8,593
Sinai,	"	28° 31′ N.	34° 0′ E.	7,498
Elburz,	Circassia,	43° 21′ N.	42° 26′ E.	18,493
Cabool, city,	Afghanistan,	34° 27′ N.	69° 8′ E.	6,382
Teheran, city,	Persia,	35° 50′ N.	51° 13′ E.	4,137
Cashmere, city,	Cashmere,	34° 3′ N.	75° 6′ E.	5,818
AFRICA.				
Kilimanjaro,	W. of Zanguebar,	3° 30′ S.	35° 0′ E.	20,000
Miltsin,	Morocco,	31° 0′ N.	7° 0′ W.	11,400
Table Mountain,	Cape Colony,	33° 56′ S.	18° 28′ E.	3,816
Nieuwveld Bergen,	" "	32° 30′ S.	24° 20′ E.	10,250
Peak of Teneriffe,	Canary Isl.,	28° 16′ N.	16° 39′ W.	12,172

LAKES AND INLAND SEAS.

Lakes and Seas.	Country.	Height in Feet above Sea Level.
Sirikol,	Central Asia,	15,630
Mansarowar,	Tibet,	15,256
Titicaca,	Peru,	12,846
Troub,	Switzerland,	7,200
N'gami,	South Africa,	2,825
Baikal,	Siberia,	1,535
Lucerne,	Switzerland,	1,407
Constance,	“	1,250
Geneva,	“	1,230
Superior,	North America,	672
Lake Vau,	Armenia,	566
Aral Sea,	Toorkistan,	36
		Below Sea Level.
Caspian Sea,	Toorkistan,	83
Sea of Tiberias,	Syria,	329
Dead Sea,	“	1,312

COMPARATIVE LENGTHS OF RIVERS.

River.	Country.	Mouth.	Length in Miles.
Mississippi & Missouri,	United States,	Gulf of Mexico,	4,491
Amazon,	Brazil,	Atlantic Ocean,	3,600
Mississippi, (alone,)	United States,	Gulf of Mexico,	3,160
Nile,	Nubia and Egypt,	Mediterranean Sea,	3,000
La Plata,	Brazil, &c.,	Atlantic Ocean,	2,500
Yang-tse-Kiang,	China,	Pacific Ocean,	2,500
Niger,	Soodan,	Gulf of Guinea,	2,500
St. Lawrence,	Canada,	Gulf of St. Lawrence,	2,000
Volga,	Russia,	Caspian Sea,	2,000
Euphrates,	Turkey in Asia,	Persian Gulf,	1,800
Ural,	Russia,	Caspian Sea,	1,800
Danube,	Germany, &c.,	Black Sea,	1,725
Indus,	Hindostan,	Indian Ocean,	1,650
Orinoco,	Venezuela,	Atlantic Ocean,	1,600
Ganges,	Hindostan,	Bay of Bengal,	1,500
Dnieper,	Russia,	Black Sea,	1,230
Rhine,	Switzerland, &c.,	North Sea,	950
Ohio,	United States,	Mississippi River,	948
Columbia,	Oregon,	Pacific Ocean,	750
Elbe,	Germany,	North Sea,	720
Rhone,	Switzerland, &c.,	Mediterranean Sea,	645
Tagus,	Spain and Portugal,	Atlantic Ocean,	540
Vistula,	Poland, &c.,	Baltic Sea,	530
Seine,	France,	English Channel,	414
Po,	Italy,	Adriatic Sea,	340

GLOSSARY.

Aca'cia, a thorny tree. A genus of the family Legumino'sæ, and order Mimo'sæ. Many of the species yield gum.

Aç'id, a compound substance or fluid which unites with salifiable bases to form salts. For example, a compound of sulphur and oxygen, called *sulphuric acid*, unites with *sodium*, and forms a salt named *sulphate of soda*, or glauber salts. Acids turn vegetable blues to red.

Acid'ulous, sourish; having acid properties.

Af'fluent, a river flowing into another.

A'gua, the Spanish word for *water*.

Agul'has, pronounced *a-gool'yas*.

Al'gæ, sea weeds. These are agamous plants, which live in the air, on the surface or at the bottom of fresh or salt water.

Al'kali, a chemical term applied to the oxides of potassium, sodium, lithium, barium, strontium, and calcium. Alkalies turn vegetable blues to green.

Al'kaline, having the properties of an alkali.

Al'oe, the name of a genus of plants. The thickened juice of several of the species constitutes the medicinal gum *aloes*.

Allu'vium, gravel, sand, mud, and other transported matter washed down by rivers and floods upon lands not permanently submerged beneath water. A deposit formed of matter transported by currents of water.

Al'pine, belonging or relating to the Alps.

Alu'minum, the metalloid that forms the basis of alum; of pure argil.

Androm'eda, a genus of the family of plants called Erica'ceæ, and type of the tribe Andromedas.

Animal'cule, a diminutive animal. A term used to designate animals so small that they cannot be seen without a microscope.

Annual, yearly. A plant which rises from the seed, reaches perfection, and perishes within a year, is termed an annual.

Aphe'lion, the point of a planet's orbit most distant from the sun.

A'queous rocks are those formed by deposits from water.

Arena'ceous, sandy; of the nature of sand.

Argentif'erous, containing silver.

Argilla'ceous, of the nature of clay.

Articula'ta, animals having joints or articulations in their coverings.

Asphal'tum, bitumen. Anciently used as a cement. A black, brittle bitumen, found on the surface and banks of the Dead Sea.

A'toll, a chaplet or ring of coral enclosing a lagoon or portion of the ocean in its centre.

Aurif'erous, gold-bearing, containing gold.

Aza'lea, a genus of plants.

A'zote, the chemical name for a gas, now called *nitrogen*, which will not support respiration nor combustion. It constitutes seventy-nine per cent. of the atmosphere, and enters into the composition of *all* animal matter, except fatty substances, and into a certain number of proximate vegetable principles.

Barom'eter, an instrument for measuring the weight of the air.

Basalt', a black or bluish-gray rock, harder than glass, very tenacious, and therefore difficult to break. It is uniform in appearance, although essentially composed of pyroxene and feldspar, with a large proportion of iron and titanium. Basalt is considered as a product of igneous formation.

Bitu'men, a combustible mineral, composed of carbon, hydrogen, and oxygen.

Boul'ders, rounded masses of stone, lying upon the surface or loosely embedded in the soil.

Bran'chiæ, the gills of fishes. They are their breathing organs.

Brec'cia, a rock composed of an agglutination of angular fragments.

Cac'tus, a spine plant. Name of a genus of the family of Cacta'ceæ, indigenous in Mexico.

Calca'reous, belonging or relating to lime. Calcareous rocks are those of which lime forms the principal part.

Cal'cium, a metal which, united with oxygen, forms oxide of calcium, or lime.

Calor'ic, the principle or matter of heat, or the simple element of heat.

Car'bon, charcoal. A chemical element. The diamond is pure carbon. It is the basis of all varieties of mineral coal, and is one of the principal constituents of all organic bodies.

Car'bonate, any compound of carbonic acid and a salifiable base, as *carbonate of lime*.

Carbon'ic acid, a compound of carbon and oxygen.

Carbonif'erous, coal-bearing; containing carbon. In geology, the term is applied to those strata which contain coal, and to the period when the coal measures were formed.

Carniv'ora, an order of animals which subsist on flesh.

Ce'real, applied to grasses which produce the bread grains, as wheat, rye, barley, maize, oats, rice, &c.

Cerea'lia, a name of a tribe of grasses.

Chalk, earthy carbonate of lime.

Chlo'rine, a new name for oxymuriatic gas. It forms about sixty per cent. of common salt, and is a powerful agent in bleaching and disinfecting.

Chlorit'ic, belonging to chlorite, an earthy mineral found in the cavities of slate rocks.

Cir'rus, a tendril; a kind of cloud.

Cir'ro-cu'mulus, a kind of cloud intermediate between the cirrus and cumulus.

Cir'ro-stra'tus, a wave cloud, intermediate between the cirrus and stratus. Its mottled appearance suggests the idea of resemblance to the back of a mackerel.

Coal measures, the geological formation in which coal is found.

Conduct'or. Those substances which possess the property of transferring caloric, or heat, and electricity, are termed *conductors*.

Confer'væ, a tribe of plants of the Zoösper'mæ family. It includes many sea weeds.

Conglom'erate, any rock composed of pebbles cemented together by another mineral substance, either calcareous, silicious, or argillaceous.

Contour', the line that bounds, defines, or terminates a figure.

Conif'eræ, cone-bearing trees or plants, such as pines, fir trees, &c.

Cordille'ra, (pron. *kor-deel-yă'ra*,) the Spanish word for *chain*. A series of elevations linked together continuously, so that their length greatly exceeds their breadth.

Cra'ter, a great cup or bowl. The mouth of a volcano.

Creta'ceous, relating to or of the nature of chalk.

Crusta'cea, a class of articulated animals, as the crab, lobster, &c.

Cryptoga'mia, a class of plants which are propagated without apparent seeds.

Cryptog'amous, belonging to the cryptogamia.

Culmina'tion, the highest point of altitude.

Cu'mulus, a form of cloud.

Cumulo-stratus, twain cloud ; it partakes of the cumulus and stratus.

Debris', wreck, ruins, remains. In geology the term is applied to large fragments, to distinguish them from *detri'tus*, or those which are pulverized.

Decid'uous, a term applied to plants whose leaves fall off in autumn, to distinguish them from evergreens.

Declina'tion of any celestial body is the angular distance of the body, north or south, from the equator.

Del'ta, the Greek letter Δ. The triangular deposits, shoals, or islands at the mouth of rivers, are called *deltas*.

Deposi'tion, in geology, the falling to the bottom of matters suspended or dissolved in water.

Devo'nian system, so called because it is largely developed in Devonshire, England. It is the old red sandstone formation. It is composed at first of pudding stone, and then passes into sandstone, with which it alternates at different places.

Detri'tus, a geological term, applied to deposits composed of various substances which have been comminuted by attrition. Sand is the detritus of silicious rocks.

Disloca'tion, displacement. In geology, where strata or veins have been displaced from the position where first deposited or formed, they are said to be dislocated.

Dip, in geology, the direction or inclination of strata. "To take a dip," is to measure the degree that a stratum inclines from a horizontal line.

Disin'tegrate, to separate or break up a whole into parts.

Diur'nal, daily ; performed in a day.

Electriç'ity, from the Greek *electron*, amber, the substance in which it was first observed.

Ellipse', an oval figure ; the curve in which the planets perform their revolutions about the sun.

Endog'enous, applied to plants whose stems increase from within.

E'ocene, in geology, a name for the older tertiary formation, in which the first dawn of existing species appears.

Ethnog'raphy, the science which treats of the different natural races and families of men.

Exog'enous, applied to plants which grow by successive *external* additions to their wood.

Flu'orine, a chemical element in the form of a yellowish-brown gas.

Fo'ci, plural of *focus*, a hearth. In optics, the term denotes the point where the rays of light are concentrated by a lens.

Fos'sil, any organic body, or the traces of any organic body, whether animal or vegetable, which has been buried in the earth by natural causes.

Fossilif'erous, fossil-bearing.

Fu'cus, sea weed. A genus of aquatic plants.

Func'tion, the action of an organ, or system of organs.

Fun'gus, plural *fungi*, mushroom.

Gallina'ceous, relating to birds of the order gallina'ceæ, including the domestic fowls, or those of the pheasant kind.

Gale'na, lead ore. A mineral composed of sulphur and lead.

Gas, Germ. *geist*, spirit. The name given to all permanently elastic fluids, or airs, different from atmospheric air.

Ge'nus, a kindred or race.

Gey'sers, an Icelandic word, signifying raging, roaring. Celebrated spouting fountains of boiling water in Iceland.

Gla'ciers, masses or beds of ice formed on high mountains, derived from the snows or lakes frozen by the continued cold.

Gneiss, a rock resembling granite. It is composed chiefly of feldspar and mica, and is more or less slaty in its structure. Gneiss is used for building and flagging stones.

Grandiflora, large-flowered.

Gramin'eæ, the grasses.

Graniv'orous, applied to animals that feed upon grains.

Granite, a rock composed of quartz, feldspar, and mica.

Greenstone, a rough variety of trap-rock, consisting chiefly of hornblende.

Gypsum, native sulphate of lime.

Habitat. Used to designate the place in which animals and plants are naturally found.

Herba'ceous, herb-like; that perishes every year. An annual stem. Not woody.

Herbiv'orous, applied to animals which feed chiefly on plants or herbs.

Hi'bernate. Animals which retire and sleep throughout the winter are said to hibernate.

Hy'drogen, a colorless, tasteless, inodorous gas, one part of which, combined with eight parts of oxygen, forms water; combined with sulphur it constitutes *sulphuretted* hydrogen; and with carbon, *carburetted* hydrogen, the gas used for illumination.

Ig'neous rocks are those rocks whose structure is attributable to the influence of heat, such as granite and basalt. They are distinct from stratified rocks, or those formed by deposits from water.

Impon'derable, not having sensible weight.

Indig'enous, a native animal or plant. A foreign one is an *exotic*.

Infuso'ria, microscopic animals inhabiting water and liquids of various kinds.

Insectiv'ora, applied to animals which feed chiefly on insects.

Isother'mal, of equal temperature. Isothermal lines are supposed to pass through all places where the mean temperature of the air is the same.

Juan, pronounced *hwăn*.

Joan'nes, pronounced *zho-ăn'nes*.

Joaquin', pronounced *hwă-keen'*.

Latent heat, heat not indicated by the thermometer; that heat upon which the liquid and aëriform conditions of bodies depend, and which becomes *sensible* during the conversion of vapor into liquids, and of liquids into solids.

La'va, in geology, substances which flow in a melted state from a volcano. Lavas vary in consistence and texture.